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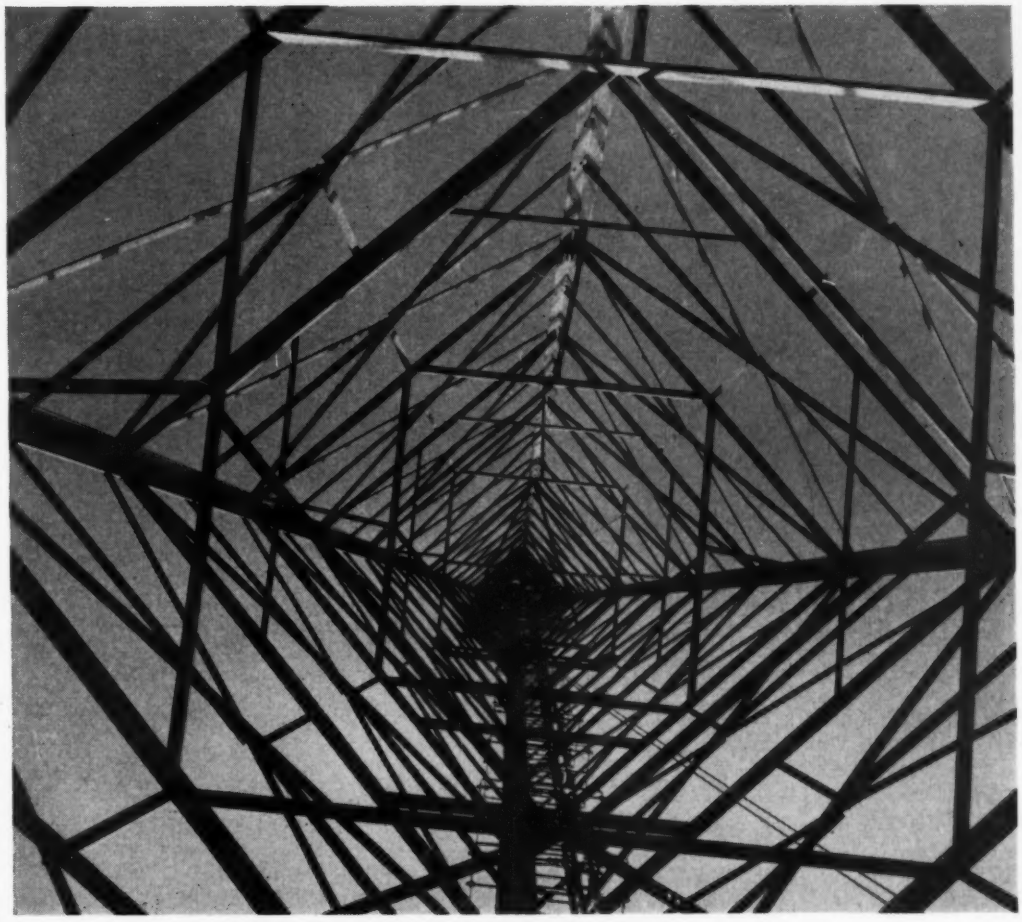
AUGUST 17, 1957
VOL. 153—NO. 7

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY



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PATTERN OF STRENGTH

Bracing required in the design of a microwave tower for winds up to 150 miles an hour. This is one of five installed in Carolina T&T's new 125-mile system. See story on page 42.

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Smartly styled No. 120 switchboard adds luster to any reception room . . . offers many operating features.

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FLASHES AND PLUGS

ORPHAN OF THE STORM. A man in Louisville, Ky., has learned that an outdoor telephone booth is not necessarily a safe haven during a storm.

Wind toppled the booth and it landed on its door, trapping him inside.

He tried to kick out the glass. No luck. It was reinforced with wire. There was no use trying the telephone. It was dead.

The captive began digging with his pocketknife at the edge of the glass but gave that up when the blade broke.

He spent more than an hour in the booth before a pedestrian spotted him and turned the booth over.

•

FIGS FROM THISTLES. A telephone lineman in Nebraska who bought an old barn at auction for $35, found it a better investment than he had expected, the Associated Press reported on Aug. 7.

Les Burch, of Crete, Neb., while wrecking the building, found a tin can containing four $20 gold pieces and three $10 pieces, all in unusued or mint condition. Dates on the coins ranged from 1881 to 1900.

•

SUMMER DAZE. The *Milwaukee Journal* last week commented that "a Fox Point, Wis. couple is feeling rather sheepish about their recent swift trip to Valley Forge, Pa., and back.

"Their son, 13, attending a summer camp there, telephoned on a Monday night that he was lonesome and wanted to come home.

"The anxious parents got in their car early Tuesday, drove all day, arrived at the camp at midnight and saw their son early Wednesday morning.

" 'Everything's fine now,' he said. 'I'll stay.'

"The parents turned the car around, drove all day Wednesday and sneaked back into their house as quietly as possible. They are hoping that nobody missed them while they were gone."

•

THREE CHEERS. The following sprightly editorial approach was used by the *Champaign-Urbana News-Gazette* to record a recent Washington development:

Progress plunged a step forward on July 30 at the U. S. Capitol thanks to the telephone company.

Now you can ring up your favorite statesman at a new, faster, smoother, easier-to-remember telephone number.

The telephone number at the Capital as of 12:01 a.m. (EDT), was Capitol 4-3121. The old, tired, pokey, obscure number was National 8-3120. . . .

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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

August 17, 1957

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Lorain Dry CEMF Cells are selenium covered metal plates, specially treated so their internal resistance decreases rapidly as the current flow through them increases, making them effective as voltage regulators. The amount of voltage drop is determined by the number of plates connected in series. Bulletin 176 lists representative sizes; assemblies to meet individual specifications are readily made to order. Specific recommendations will be made upon receipt of the current and voltage limits to be met, and the preferred mounting arrangement.

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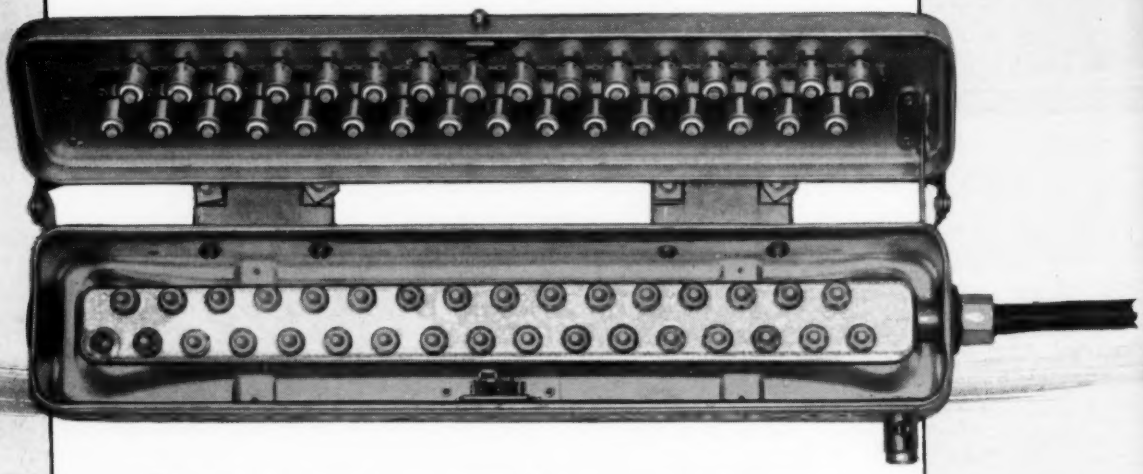

Consistent with its practice of manufacturing terminals which meet the wide range of conditions encountered in the large geographic area served by the Independent Telephone Industry, as well as the requirements of the export field, Cook Electric Company now offers the Seaboard Stranterm. Built completely of Everdur, this new terminal, as its name implies, meets the highly corrosive conditions created by salt water spray and humidity.

Seaboard Strantermo contain all of the exclusive and outstanding features which have been engineered into the Cook Stranterm line, and are available in 6, 11, 16 and 26-pair sizes with optional pair protection.

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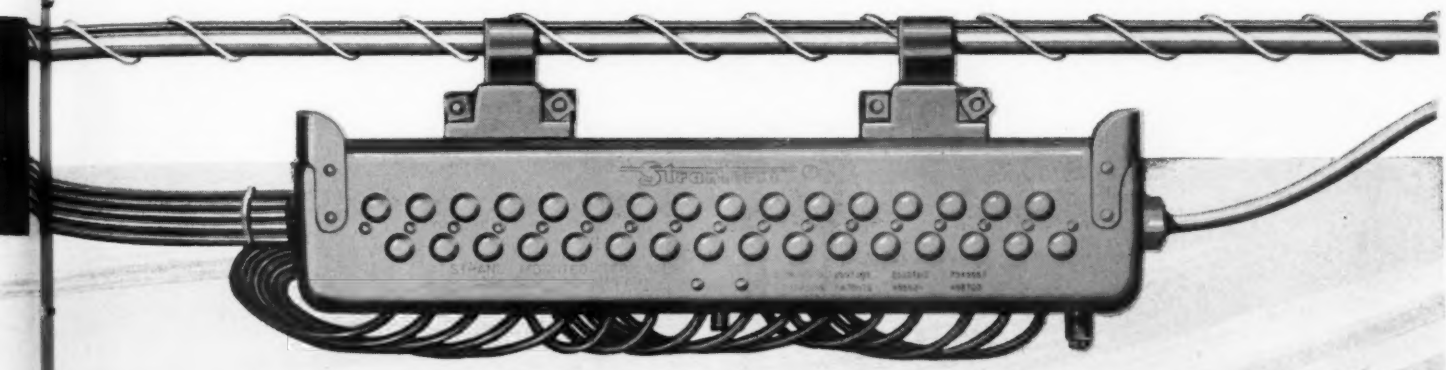
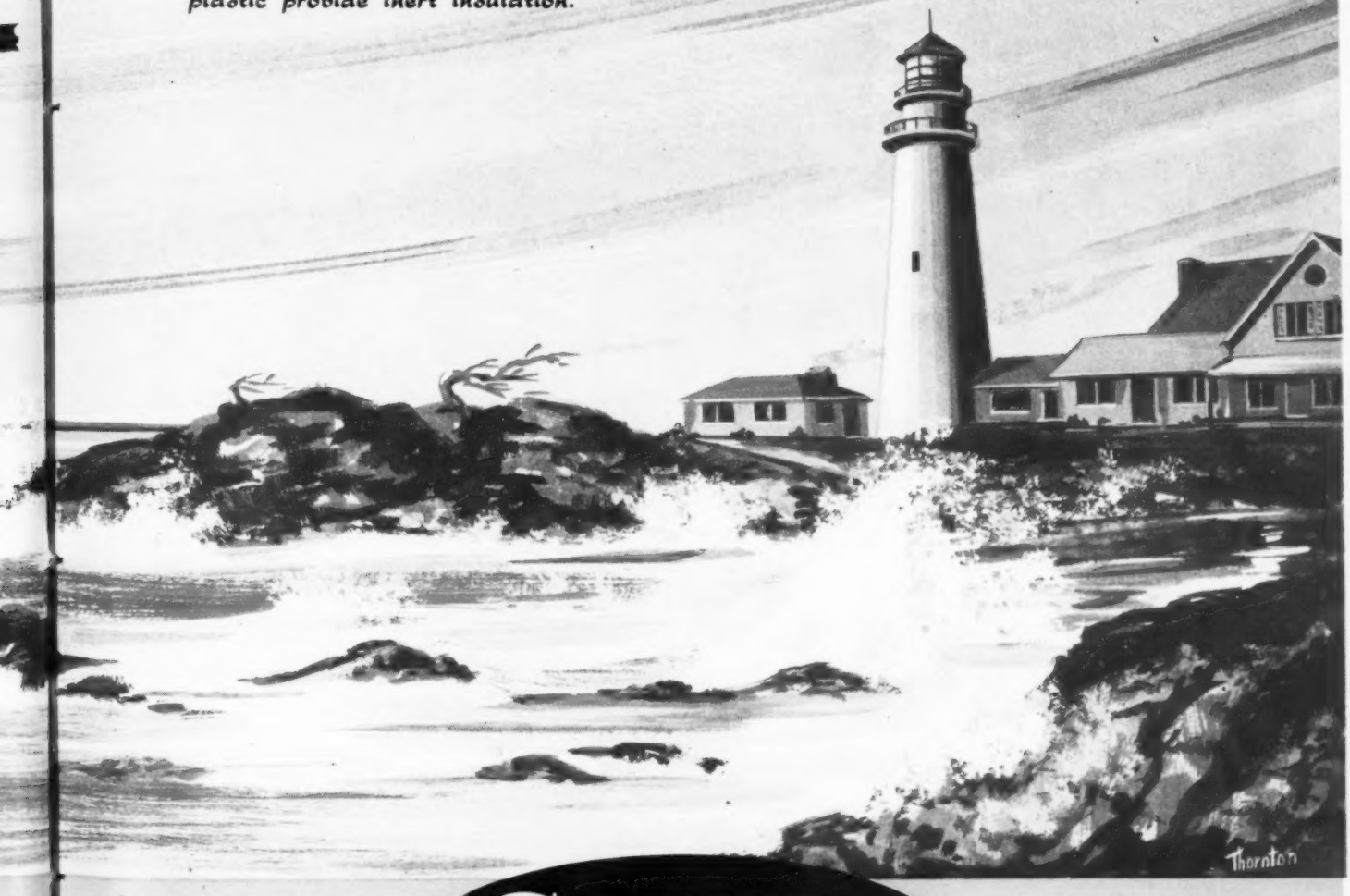


The Seaboard Stranterm is designed and produced especially for coastal installations, the maritime provinces, chemical plants, railroad right-of-ways, in heavily concentrated industrial areas and similar regions where excessive atmospheric and electrolytic corrosion is experienced. All metals are of Everdur. Neoprene gasketing and special unsaturated polyester thermal setting plastic provide inert insulation.



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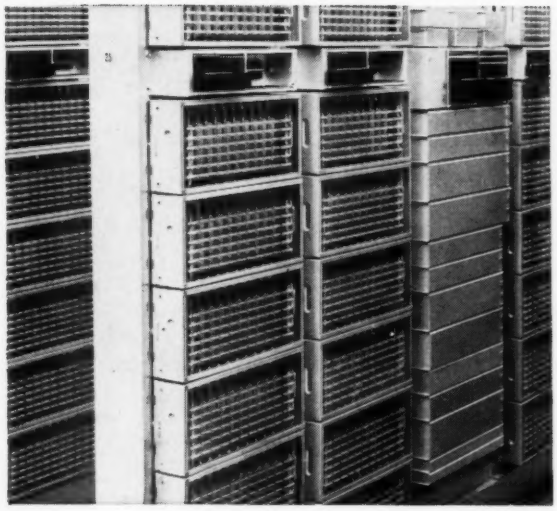

Recently the management of the Mansfield, Ohio, Telephone Company appraised the industrial, commercial, and residential growth of their city. They projected future requirements on the telephone system. They took a searching look at the advances that would shortly become reality in the telephone industry.

This long range appraisal and analysis convinced them that they required new switching facilities to keep pace with growth and provide for the future.

The Mansfield Telephone Company determined that their requirements could be met only with switching equipment that *allowed complete flexibility in number assignments . . . . . was compatible with other telephone systems . . . . . was designed for nation-wide toll dialing . . . . . had the ability to meet unusually high traffic peaks without interruption of*

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service . . . . . provided superior noise-free transmission with faster and more efficient operation . . . . . offered highest service reliability . . . . . required an absolute minimum of maintenance . . . . . needed less space to allow for future expansion without additions to the building.

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▲ Mr. Winters discusses the details of every home he builds with the people who will be living in it. Telephone facilities are planned for the future as well as the present.

Mr. O. C. Winters, a custom builder in Indianapolis, Indiana, knows from experience that home buyers want planned telephone outlets in their new homes, with the wiring neatly concealed in the walls. This month a testimonial to that effect from Mr. Winters is appearing in nine publications read by architects and builders all over the country. This testimonial is part of a continuing campaign to promote planned telephone facilities and concealed telephone wiring in these magazines.

Everybody benefits: the homeowner because his telephone service is more convenient and his interiors neater; the builder because his houses are more salable; America's telephone companies, because extensions sell faster when the outlets for them are ready and waiting.

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Far greater channel capacity than ever before! With the Lenkurt Type 45BX Radio Carrier System, you can now get up to 120 telephone channels in one system. Want to add even more channels some time in the future? It's simple. Two more 120-channel systems over paralleling radio paths can be added easily, giving you as many as 360 channels!

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Type 45BX Carrier meets all your requirements for flexible, low-cost, reliable performance. Start small, if you desire, with as few as 12 channels. Later on you can add 12- or 24-channel groups on a stackable basis. Regardless of the number of channels, your per-channel cost will remain essentially constant. Each 24-channel group operates independently; equipment faults and tests in one group do not affect the rest of the system. There's no sacrificing of flexibility, either; channel groups can be dropped out or inserted as desired, at intermediate points between end terminals.

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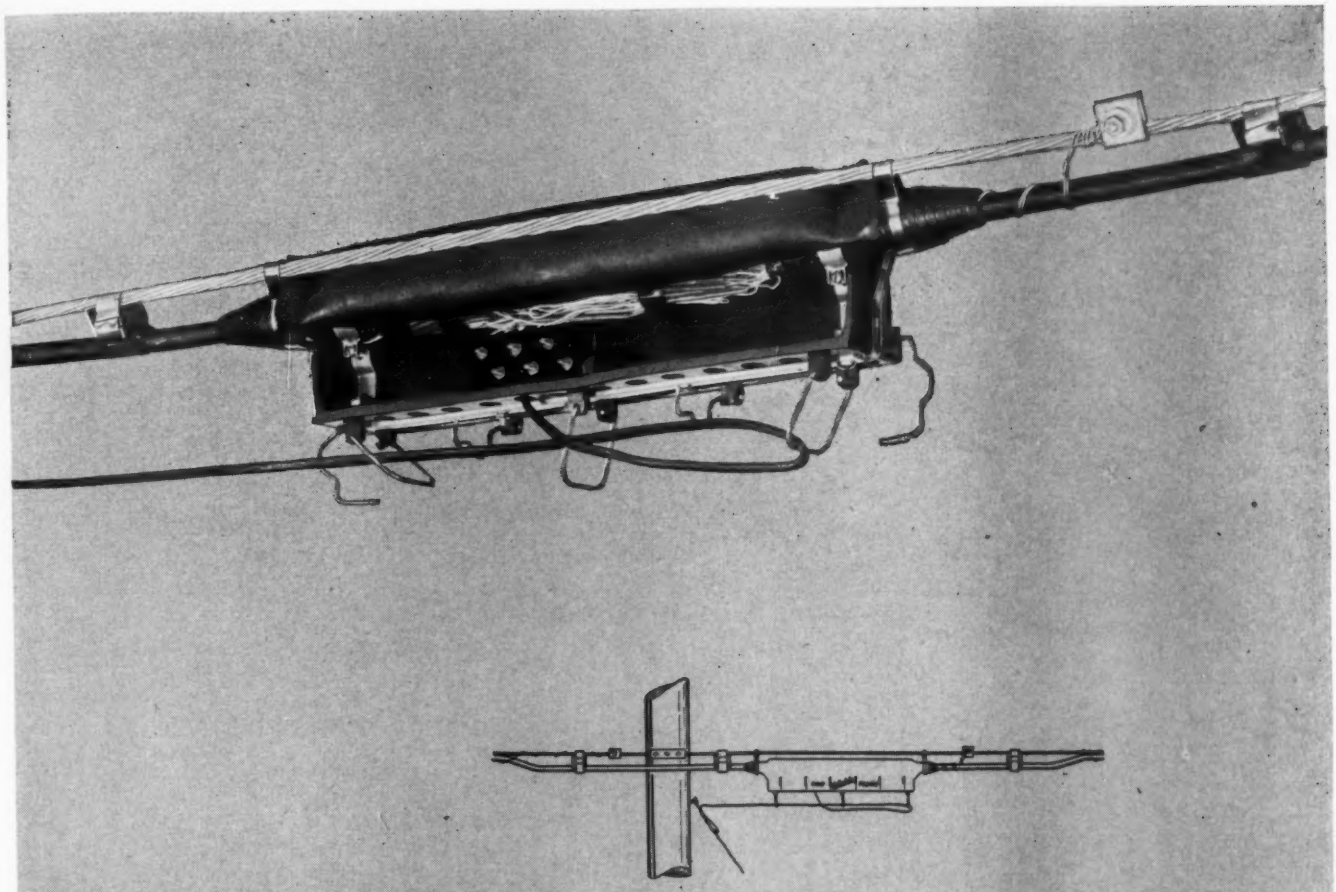

Announcing the ready- access terminal

This new ready-access terminal is first a straight splice for plastic-jacketed, plastic-insulated cable.

An installer-repairman or a cable splicer can add up to four, 6-pair, unprotected blocks or space may be used to include loading coils.

The flexible neoprene housing is workable below zero and is unaffected by summer sun. Good design and best quality throughout insures a long service life.

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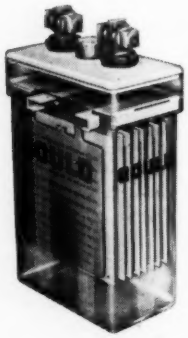

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

Connecticut court rules commission doesn't have authority to peg stock prices. House subcommittee investigating federal regulatory commissions adds chief counsel . . . expectation is that FCC will be its first target. Independent wins round in ship-to-shore matter. Depreciation rates prescribed by FCC for Bell System station equipment.

DOES A REGULATORY commission ordinarily have any authority over the price which a telephone company should get for its stock when it is issued? This question has come up rarely and the answers are none too certain. A recent decision of the highest court of Connecticut leaves no doubt about what the law is in the Nutmeg state. The law is that the Connecticut Public Utilities Commission does not have any such authority.

The case arose when the Connecticut commission attempted to set a minimum price on a proposed new issue of stock by Southern New England Telephone Co. After a hearing in September 1956, the Connecticut commission had granted the telephone company's application to issue 679,012 shares of stock, but it said it must be sold for not less than $32 a share. The company had proposed to offer the stock for $30 a share.

The telephone company appealed on grounds that the Connecticut regulatory statute gave the commission no authority to fix a price at which its stock was to be sold. A lower state court (Superior Court Judge Louis Shapiro) upheld the company. The commission took an appeal from this decision to the Connecticut supreme court of errors. This court has now ruled that the commission "clearly exceeded its authority" when it set a minimum price.

The highest state court's opinion, which was unanimous, was written by Associate Justice Kenney Wynne, who found only a minor error in the decision of the lower court. The lower court had merely directed the commission to strike out of its order that part which attempted to set the minimum price of the stock at $32 a share. Justice Wynne, for the highest state court, said that the lower court should have gone further and directed the commission to approve the telephone company's original petition. He pointed out that no statute requires the stock of any corporation to be issued at a price in excess of par.

Investigating the Commissions

Recently in this department some comment was made upon the appointment in the House of Representatives of a special subcommittee (of the House Interstate and Foreign Commerce Committee) to investigate the federal regulatory commissions. There have been more developments along this front.

One is that the Federal Communications Commission is going to be the first target; another is that the subcommittee has completed its organization with the hiring of a chief counsel. He is Dr. Bernard Schwartz, director of the New York University School of Law's Institute of Comparative Law. He is a leading authority on constitutional and administrative law. The subcommittee, which has the peculiar name of "Subcommittee on Legislative Oversight," will be headed by Representative Morgan M. Moulder (D., Mo.).

As chief counsel, Dr. Schwartz will be a key figure in an investigation that is counted on to generate important news. It will dig into the question of whether such agencies as the Interstate Commerce Commission, FCC, and nearly a dozen others are doing the job Congress had authorized and empowered them to do. Pressure for such an inquiry has been building up for several months. Last April the House of Representatives approved $250,000 to carry the investigation through 1958, which is an election year.

Representative Moulder hopes to have his investigating group ready for public hearing by October. The reason why the Federal Communications Commission is likely to be the first to be investigated is that it has been the subject of a running attack by another House group—the Antitrust Subcommittee of the House Judiciary Committee, headed by Rep. Emanuel Celler (D., N. Y.).

Celler is the Congressman who very much objected to the FCC going ahead with giving any clearance for pay-as-you-see TV. While the FCC has not yet actually authorized subscription television on a commercial basis, it has indicated that it is going to do so in the future. And it has further indicated that it believes it has the authority to authorize such operations, unless Congress expressly prohibits the FCC by changing present law. Representative Celler differs on this interpretation and has warned the FCC not to go ahead with its plan.

A quarter of a million dollars is a sizable amount of money for a subcommittee to spend on an investigation in a single year. And the size of that appropriation (approved by a rather economy-minded House) expresses the importance the congressional leaders attach to the activity of the subcommittee.

It was Speaker Rayburn himself, a former chairman of the House Interstate and Foreign Commerce Committee, who took the floor last March to request this investigation of all regu-

latory agencies. He said it was necessary to find out "whether or not the law as we intended it is being carried out or whether a great many of these laws are being repealed or revamped by those who administer them."

The Federal Communications Commission and the other commissions have already been asked to supply the subcommittee with complete sets of laws, rules, regulations, and policies. The staff officers have been studying these for several weeks. Chief investigator of the subcommittee will be Baron I. Shacklette. He was formerly an investigator for the House Legal and Monetary Subcommittee.

Ship-to-Shore Service

An Independent telephone company has won an important round in its effort to maintain ship-to-shore service in the Great Lakes area. This came in the form of a decision of an examiner of the Federal Communications Commission, denying applications of Wisconsin Telephone Co., Ohio Bell Telephone Co., and Michigan Bell Telephone Co. for authority to provide ship-to-shore telephone service on the Great Lakes waterways between Buffalo and Duluth.

This decision, by FCC Examiner Basil P. Cooper, was based on his conclusion that there would not be such a substantial increase in ship-to-shore telephone traffic as to justify the licensing of the three Bell companies as requested.

The Lorain County Radio Corp.—a subsidiary of the Lorain Telephone Co.—now handles approximately 60 per cent of all radio traffic on the Great Lakes. It does this through four coastal harbor stations. Despite the fact that it charges $1.25 for that radio link of its calls, the common carrier operations of Lorain Radio have been conducted at a loss in recent years. The losses have been offset by profits from its manufacturing, installing, servicing, and maintaining equipment. During the years 1953 to 1955, Lorain Radio handled a total of 214,502 calls, for which it received gross revenues of $296,-822.67.

The three Bell companies contended that they were in a better position to offer a proposed service if they could obtain the licenses. But Lorain Radio was able to prove that it was rendering a good and valuable service which should be protected from unwarranted competition. The FCC examiner was inclined to agree with this. He stated in one of his conclusions:

"The owners and masters of the lake cargo vessels find that the existing radio communication facilities are adequate, have not requested additional VHF coastal stations, and some would not use the same if they were constructed.

"Yacht owners find the existing facilities to be adequate and have not requested additional facilities. The yacht owner fears the loss or curtailment of the use of the present FM band and the cost which would be involved if he had to install both AM and FM radio-telephone equipment."

Examiner Cooper also found that each of the Bell system applicants had over-estimated the amount of traffic and the amount of revenues which each proposed Bell company station would handle.

He further found that, in view of the lower rate which the Bell System companies proposed to charge, he could only conclude that the operation of the Bell stations would not be compensatory.

On the other hand, the loss of such traffic would adversely affect the ability of Lorain Radio to continue the service which it now renders and which many ship masters and operators of large cargo vessels and yacht owners have found to be adequate.

Another existing operator of ship-to-shore radio service in that area is Central Radio Telegraph Co. This company, which had been operating along with Lorain Radio, is not an Independent telephone company, however. All of its stock is owned by the United States Steel Corp., which does a great deal of shipping in the area.

Examiner Cooper took the position that if the Bell company licenses were granted and there were no substantial increase in the volume of ship-to-shore business, it would necessarily follow that the existing common carrier operators (Lorain and Central) would be damaged. He stated on this point:

"The establishment of all or any one of the (Bell) coast stations proposed herein would enable the VHF-FM equipped ship, when within range of a coast station, to establish a ship-to-shore radio-telephone circuit of high quality for the handling of public correspondence. Any one or all of the proposed coast stations would handle some radio-telephone traffic.

"It is doubtful, however, that there would be any substantial increase in the total telephone usage on the Great Lakes and it is apparent that most of the calls which would be handled would be calls diverted from the existing facilities of Lorain Radio and Central. The effect of such diversion on the ability of Lorain Radio and Central to continue to render adequate service has been previously referred to.

"While high quality ship-to-shore radio-telephone communication and the possible elimination of the momentary overloads which now occur on the existing communication system on the Great Lakes are to be desired, the price which would be paid for the proposed stations is too high."

Examiner Cooper's decision turning down the Bell petition and holding that Lorain Radio and Central operations should continue in the public interest,

(Please turn to page 36)

REA Loans $309,000 to Kentucky Co-Op

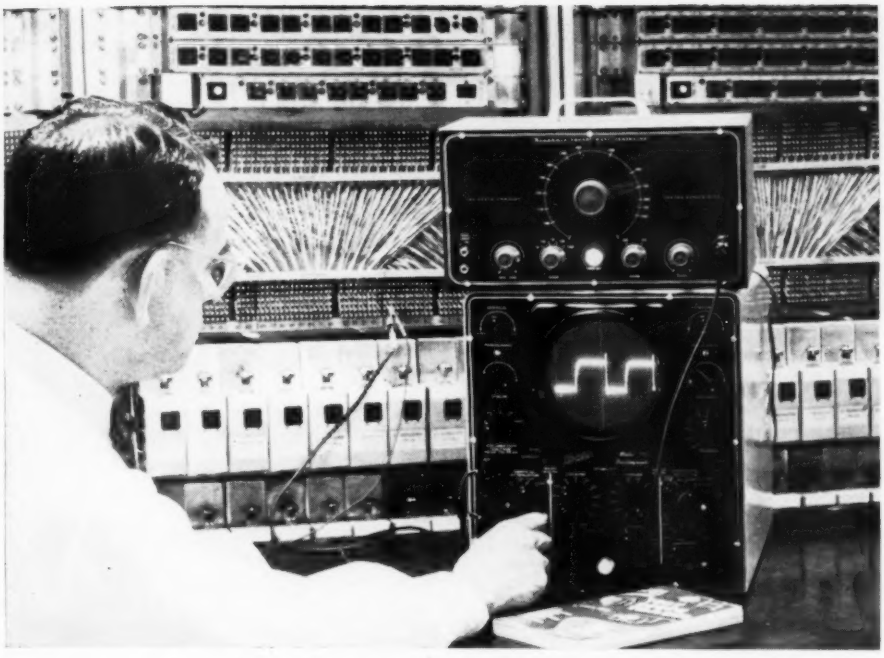
The Rural Electrification Administration approved one loan the week of July 28 to improve and extend telephone serivce in rural America, the U. S. Department of Agriculture announced on Aug. 7. The loan, amounting to $309,000, was approved Aug. 1 for the Mountain Rural Telephone Cooperative Corporation, Inc., West Liberty, Ky.

The cooperative plans to use these funds to improve and extend service to 443 rural subscribers. The borrower will use part of the loan to acquire the Frenchburg (Ky.) Telephone Co. The Frenchburg company now provides magneto service to 218 subscribers over about 65 miles of line from a leased central office at Frenchburg.

The proposed new facilities will provide improved service to 218 existing subscribers now served by the Frenchburg Telephone Co., and initial service to 225 new subscribers from an unattended automatic central office to be built in Frenchburg. Toll and operator assistance will be provided by the Winchester office of Southern Bell.

This and the three previous loans total $1,129,000. The Mountain Rural Telephone Cooperative will furnish new and improved service to 1,768 subscribers. The extended system will consist of six exchanges at West Liberty, Sandy Hook, Campton, Hazel Green, Ezel and Frenchburg. The first five exchanges, cut over to service during 1954 and 1955, were serving 1,071 subscribers in March 1957. The central office at West Liberty contains commercial office space.

W. A. Heagen is president of the Mountain Rural Telephone Cooperative.



The response of telephone repeaters is displayed by means of the Heathkit square wave generator (top) and the Hickok cathode ray oscilloscope. (Photo by Louis Landman.)

Square Wave Testing

By HAROLD B. McKAY

TELEPHONY's Electronics Editor

A PREVIOUSLY published series of articles in TELEPHONY dealt with the use of the cathode ray oscilloscope in the telephone plant. These articles were directed towards the application of this instrument to existing telephone plant operations. In the course of the experiments performed, it appeared that another field was worth exploring. This was the application of radio techniques to telephone circuits.

If this could be done, an immediate advantage would result, particularly for the small company. This would occur because a great amount of radio test equipment is available which is much lower in cost than the types ordinarily used for telephone work.

Further, because of the rapid advance in electronic techniques in the telephone business, it is only a matter of time before radio parts and test equipment and training methods will be used widely in the plant anyway.

The advent of Direct Distance Dialing (DDD) has placed emphasis upon good transmission, not only because of the rapidly increasing use of repeaters and carrier, but because just plain telephone coils, relays and lines must give a better grade of transmission than ever before.

Many alert young men in the telephone business are probably more aware of the trend than are the managers of the companies, and these young men have taken to correspondence schools and other training and are purchasing and reading books to make themselves proficient in the electronic arts.

In addition, some have purchased their own test gear in order to make on the job tests electronically and thus make their work easier.

Inquiries brought out the suggestion that some electronic techniques and test equipment could be used without modification in the telephone plant. Men were found who were successfully using such devices as cathode ray oscilloscopes, vacuum tube voltmeters, signal generators and tube testers which were made from "do-it-yourself" kits, which cost only a fraction of the price of a professional instrument.

One instrument which is widely used in radio, audio and high-fidelity work is the square wave generator. This is an oscillator arrangement which will put out alternating current at various frequencies, but in the form of a square wave instead of a sine wave. This feature enables the user to make a series of tests which will determine the transmission qualities of any kind of a circuit—whether high frequencies are better or worse than low frequencies, whether equalization and feedback is correct, and many other things.

It would seem if this device is used with success on everything from television sets to phonographs, it might also be a handy thing in a telephone exchange. Because of the current high interest in build-it-yourself kits, it was decided to combine this experiment with an evaluation of such a kit.

Heathkit

The Heath Co. of Benton Harbor, Mich., cooperated with us by supplying a square wave generator kit (Model number S-1). Although experience with this kit was exciting enough to suggest coverage of the whole subject of kits in a separate article, a few facts are worth reporting here.

The kit arrived by mail and consisted of a cabinet in which were packed the four tubes and over 50 electronic parts and a bag of hardware. A handbook which served both as assembly directions and a method for using the instrument was included.

Also, in addition to the regular wiring diagram, a large pictorial hook-up chart was enclosed. This was supplied so that it could be wall-mounted over a work bench.

This pictorial chart showed the ac-

tual chassis wiring, and would permit even a person who could not read electrical diagrams to connect up the set. In addition, a photograph of what the finished set should look like was included in the handbook. Tips on hook-up procedure, operation and trouble shooting were given also.

Following directions as given, the kit was assembled into a working instrument in about three and one-half hours. The finished job is a handsome, neat cabinet that looks just as professional as expensive test equipment, yet this unit is made to sell for less than $30.

Use With Scope

The square wave generator is used with a cathode ray oscilloscope. A square wave of appropriate frequency is sent into a piece of apparatus, and then observed on a scope as it emerges from the output. Thus, one can visually note how square the wave is after it has gone through the system being tested. Changes that occur in the shape of the square wave can tell a great deal about how a piece of equipment is working.

Although you can do a fair job of square wave trouble shooting by just comparing the wave shape you get with illustrations you can see in a book, it helps to understand strange configurations if you have some knowledge of how a square wave is made up.

Regardless of how a square wave is created, by an oscillator, door-bell, relay or telephone dial, it is actually composed of a great many odd harmonics of the fundamental frequency. This is true even if the wave is created out of just plain direct current, interrupted by a telephone dial.

Fig. 1 shows a sine wave with several odd harmonic waves inside of it. Actually, if these harmonic waves are in phase as shown they will add to the fundamental sine wave and push out corners on it until a square shape appears. Actual square wave generators may not add separately created harmonics to a sine wave but may create all of the harmonics by simply running a sine wave through a clipping or limiting circuit which will chop off the top of the wave. This will take away the sine curve and leave a flat top. This makes nearly a square wave and additional shaping circuits can be used to get the desired results.

The generating and use of a square wave can be thought of in the following manner:

High Frequencies. The higher the harmonic, or frequency present in the square wave the steeper the leading edge of the wave must be. This is because if the frequency is high, the time of each cycle must be short. Thus, a wave of 1,000 cycles per second must get from zero up to maximum voltage in 1/1000th of a second. This means its must go up fast; therefore, the wave must be steep.

Actually in a square wave, the higher frequency harmonics which are present make the leading edge of the wave go up so fast it seems like a straight vertical line. In some cases the line may be so steep as to disappear altogether.

From this principle a fundamental fact to remember is developed. *That is, the steeper and straighter the vertical line is, the higher the frequencies are which are being handled by the circuit being tested.*

Low Frequencies. On the other hand, if direct current is represented graphically, or connected to the plates of an oscilloscope, a horizontal line results. If, for instance, you set up a scope so that it shows a straight horizontal line, then connect dc. to the input, the horizontal line will raise or lower on the screen proportional to the voltage, but it will still be a horizontal line.

Now, direct current may be regarded as simply zero frequency, so you may think of the horizontal line on a square wave as the lowest frequency, just as the vertical line represents the highest frequency.

Therefore, if you connect a square wave up to a circuit and view the wave on a scope as it comes out of the circuit, the shape of the wave will tell you how well the circuit is transmitting different frequencies.

If the vertical lines are sloping instead of straight up and down, it means that high frequency transmission through the circuit is deficient. If the tops and bottoms of the waves, which are supposed to be horizontal and flat are slanted or curved, it means something is wrong with the low frequency response.

A number of other conditions can be detected by square wave analysis. These will be discussed in our next article.

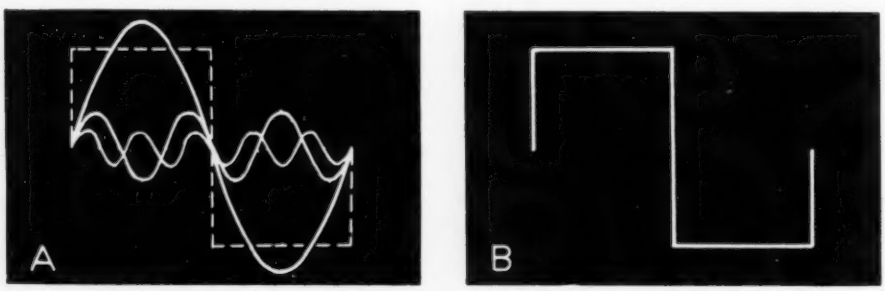


Fig. 1. A square wave is actually made up of many odd harmonic sine waves. If the harmonics shown in A are added to the main fundamental sine wave, a square wave like B results. (Drawings by Victor Willard from Heath Co. originals.)

SAFETY THUMB TACKS

By John A. Bracken

Bits of safety reasoning, either pointed or flat, depending upon the way you look at them:

"When SAFETY is neglected, it is a simple matter to determine the cause of an accident after it happens."

•

"A SAFE worker looks to SAFETY twice—once for himself, and once for the other fellow."

•

"Each SAFETY problem requires a liberal application of common sense."

•

"An accident may be closer than you think—prevent it by playing safe."

•

"Tiredness ofttimes plays a part in the cause of accidents—avoid fatigue."

XUM

Advantages of Extended Area Service

By J. N. ELLIOTT*

I THINK it would be well if I start this discussion by defining the term "extended area service" (EAS). It is fairly common, in our business, to make a toll charge for telephone calls between two different communities even though these communities may be rather closely situated, say only 5 or 10 miles apart. This form of rate treatment is so widespread and has been in effect for so many years, that customers—either willingly or perhaps reluctantly—have come to accept it as the usual thing.

Frequently, however, there is a situation where the communication needs of the people in one community make it desirable to include in the local or flat-rate calling area of that community, another nearby community, and when this is done, telephone subscribers have extended area service.

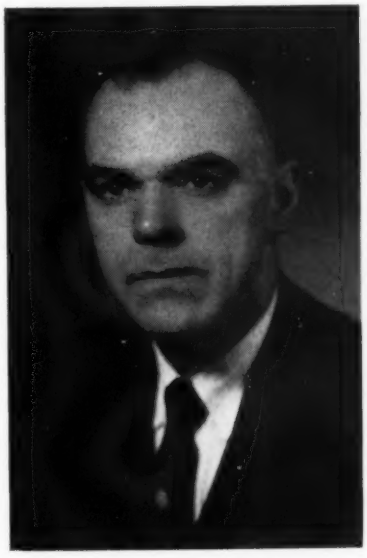
More specifically, we are providing extended area service when two or more exchanges, each including a central city or town and its surrounding area are included in the flat-rate calling area of one another and there is no separate toll charge for messages between customers in the exchanges involved. Briefly stated, it is "toll-free" service across an exchange boundary line.

In a broader sense, there can be extended area service of a sort within an exchange. Frequently, two or more towns are served from one office and included in a single exchange, and customers have the privilege of making calls between them without a toll charge. Our Illinois Bell exchanges more often than not are comprised of more than one town, and in one instance we have an exchange that serves as many as 10 different municipalities.

Normally, however, extended area service refers to local calling between two separate telephone exchanges, and it is in that sense that I use the term.

Public Welcomes EAS

At the present time there are many such extended area service offerings throughout the country. In the case of my own company's operations in over 200 exchanges, about three-quarters, or 150 of them, now provide customers with extended area service to one or more nearby exchanges, or soon will be providing such service under orders recently issued by the Illinois Commerce Commission. And, we feel we still have a long way to go before we will have satisfied the entire public requirement for such service.



J. N. ELLIOTT

Our experience indicates that customers have welcomed the introduction of extended area service and are well pleased with it after it has been established. In fact, I don't know of any instance where full extended area service has been discontinued once the offering has been made.

Call it merchandising, or whatever you will, telephone companies are working hard to provide customers with the most adequate service they can. Service becomes more adequate as the percentage of families with telephones increases, as more customers have individual line service, or share their line with fewer other people, and as more extensions are added. Also, it becomes more adequate as local calling areas are enlarged and the restrictive influence of the toll charge is removed.

These improvements, including extended area service, are all in the direction of making telephone service more attractive and easier to use. Consequently, these improvements promote greater use of telephone service, and, of course, greater use represents added value for the customer.

I would like to point out a few of the more favorable aspects of extended area service. One of the most important factors is that customers desire this offering where there is a need for this type of service, and they are aware that it adds value to their service. Extended area service is valuable not only in that it permits the customer to make calls to more telephones in an enlarged area on a flat-rate basis, but also it permits him to receive calls from more telephones on a flat-rate basis.

In other words, greater incoming use of service is made available as well as more outgoing use. The business subscriber, particularly, is aware of this advantage.

Use Increases With EAS

Probably the best indicator of the value of service is the use that is made of it. When extended area service is offered, the usage of the service, that is the amount of calling between the

*Mr. Elliott is Acting General Rate Engineer of Illinois Bell Telephone Co. and he presented this address at the recent convention of the Illinois Telephone Association.

communities involved, increases substantially. Some of the experience we in Illinois Bell have had, where extended area service has been established and the toll charge eliminated, shows that customers make on the order of three to four times as many calls as they did when toll charges applied.

In one recent instance, for example, our studies showed that the volume of calling between two contiguous exchanges was 300,000 messages annually when a 15-cent toll charge applied, and 1,100,000 annually when the toll charge was eliminated.

Even though the basic monthly rates for local service are higher, customers seem to be best satisfied when they can call all the points with which they have frequent business and social contacts without having to pay a separate toll charge for each call. This appears to be especially true in small exchanges where the citizens must depend on a larger nearby community for their shopping, social, entertainment, employment, and professional needs.

We are all aware of the impact of the changes in living and working habits of people that have occurred in the past 10 or 15 years. In this connection, I feel it would be appropriate to quote a statement which Illinois Bell included in a recent petition to our state commission, seeking the approval of that body to introduce extended area service between a number of our exchanges. This is the statement:

"In recent years there has been more and more calling by telephone between neighboring exchanges. This has been especially true of the exchanges named in this petition. These exchanges are located in the Chicago region, where the rapid growth in population and even greater growth in the number of telephones has been an important factor contributing to the increased calling.

"New homes and communities have been built particularly in the outlying areas of exchanges; frequently these new housing developments adjoin or even straddle exchange boundary lines resulting in toll charges between near neighbors under present tariffs.

"Improved means of transportation, including greater use of the automobile, have minimized the effect of distance, so that people no longer need to live in close proximity to their places of employment, shopping centers or other centers of interest, and economic and social interests are more widespread.

"These changes in living conditions and working habits and the growing interrelationship of communities are all factors reflected in the increased calling between these neighboring exchanges, and in the greater need and desire on the part of subscribers for wider local calling areas."

I believe this statement pretty well summarizes current conditions, not only in the Chicago region but in a good many other areas as well.

Avoid Toll Charges

Aside from not having to pay a separate toll charge for each message to places they frequently call, our customers like to know in advance the approximate amount of their bill. It is difficult for them to estimate what their volume of calling might be, and we all know of occasions when it has been hard to explain to a customer that he and his family have made as many calls as the toll statement indicates.

Another important feature of extended area service is that it avoids separate toll charges between neighbors who may be down the road just a short distance from one another. Customers find it difficult to understand why they have to pay a toll charge to call a next-door or nearby neighbor with whom they have frequent occasion to talk, while they can call some other person located miles away on the other side of the exchange, with whom they have only infrequent contact, on a flat-rate basis. Toll charges for these very short distance calls are always a possible source of irritation to customers. They are frequently the cause of requests to alter exchange boundary lines.

Another feature which seems to represent an advantage of extended area service is the possibility of greater telephone development. More people are willing to subscribe to telephone service, even at a higher monthly rate, if the rate covers service to the entire area of their major calling interests. I would like to cite a recent case in evidence.

A short time ago, in a very small exchange contiguous to one of our larger ones, as part of our preparation for building a new dial office, we canvassed residents in the area to determine how many wanted service and whether or not they preferred extended area service to the large exchange. Ninety-eight per cent of the people there requesting service expressed a preference for the extended area service, and one out of every six of them said he was not interested in having any service at all unless it were furnished on an extended area basis.

We later obtained commission approval to furnish the service that way, and I am convinced our family development was substantially higher as a result, than it would have been otherwise.

Calling Rate Increases

We have studies which show that the more telephones which customers in an exchange can call without toll charges, the higher the average calling rate of that exchange. It seems only reasonable to assume that people who make greater use of telephone service as part of their everyday life are more apt to keep the service through periods of less than favorable economic conditions.

More use means greater dependence on the telephone, and this dependence in turn should offer at least some insurance against disconnections for economic reasons.

I would like to spend a few minutes outlining some of the more important factors to be taken into account in reaching a decision as to whether to offer extended area service. Once there is some evidence of a definite community of interest between two or more exchanges, careful consideration must be given to all of the interests which would be affected by offering service on this basis.

Here are some of the factors to be evaluated, or activities to be undertaken which I believe will be helpful guides in making the decision:

(1) *Message Usage Between the Exchanges Involved.* This is a highly important factor, and there are a number of ways that data can be obtained to evaluate it. Over-all calling volumes between exchanges can be determined from a count of toll tickets for a short period of time, say 10 days. Traffic departments in some companies make what are called "good and canceled" ticket studies. Inflating these data to a monthly (or an annual) basis, and then equating them to a common denominator of messages per terminal per month (or per year), provides an excellent indicator of the telephone interest between communities.

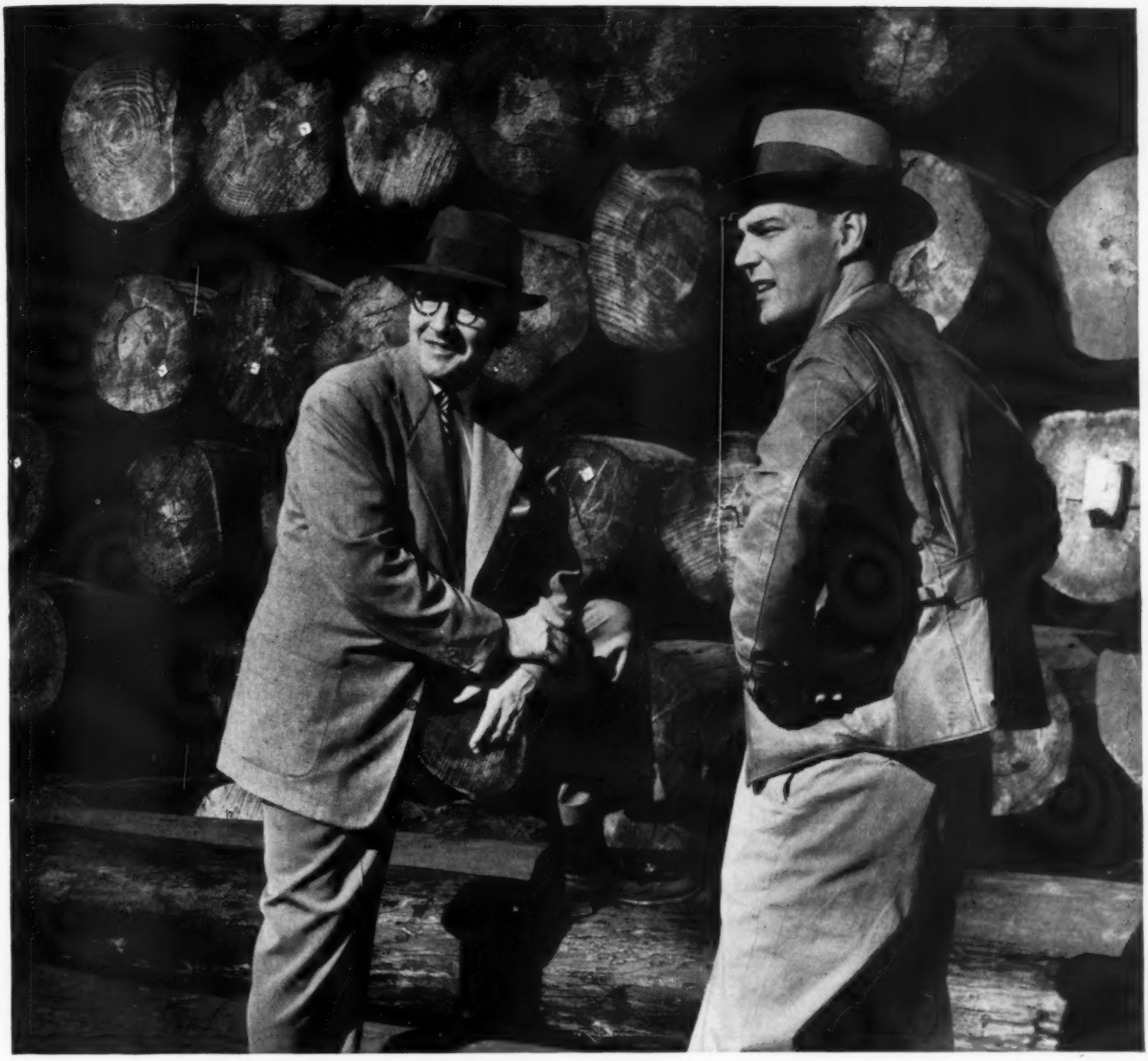
In my company, this indicator is termed the "community of interest factor" (CI), and our experience seems to indicate that if, on an average, the CI factor is as much as four or five messages per terminal per month from one exchange to another, there is enough interest to warrant serious consideration to furnishing extended area service. With this level of usage the chances are excellent that the general body of customers will be in favor of having the extended area service.

If counts of traffic volumes have been taken over several periods of time, a trend can be developed, and this information can be significant, especially where the community of interest has been growing.

EAS Meets Needs of Many

An adequate sample study of individual customers' bills, is often worthwhile. This will provide evidence that

(Please turn to page 38)



We switched to Penta-treated poles because the records prove they're better

Ran into Ernie—he's division maintenance super—in the pole yard yesterday. He asked how things were going in purchasing, so I told him that among other things the new specs had come through and we'd been busy changing our purchase orders to Penta-treated poles and crossarms.

Right away Ernie started telling me all over again why he'd recommended the switch—that Penta-treated poles are cleaner and easier to handle. He reminded me that U.S. Government tests and service records of other utilities prove that Penta keeps rot and termites out of poles and gives them a longer service life. And he mentioned that many other utility companies are switching to Penta, too.

After he got all through, I assured him that specifying Penta caused no special problems in purchasing because Penta-treated poles and arms cost no more than those treated with old-fashioned preservatives.

THE DOW CHEMICAL COMPANY, Midland, Michigan, Department PE 502E.

YOU CAN DEPEND ON DOW

What are we doing in the supply business?

by John Voss

When Tommy Thompson and I sit down, each year, to estimate our sales budget for the next year, we put an important allocation opposite the listing entitled *"Construction Materials and Supplies."*

That's the part of our overall operation managed by Chet Reynolds, out in Chicago, and distributed out of five branches. Wire and batteries and pole-line hardware and tools and that sort of thing.

Once in a while, somebody asks me why we engage in this business of distribution—why we don't stick exclusively to CDO and subscriber equipment. The answer is that your purchases of the supplies we sell bring a fair profit which we use to support our research and development in products to reduce your operating costs and increase your revenue.

You see—like yourself—we are a truly independent company. Your problems are ours—and unless we are a few steps ahead of Telephony (and of our competition), both of us are apt to get into a rut.

I looked back over the Development projects of the last six or eight years, and checked off these as typical examples of new things we've been able to perfect, because you people have been generous in giving us income to work with.

The refinement of XY® CDO equipment—especially those features which make it so easy to maintain—meaning that a lot of companies can put most of their "repair" budget into capital equipment.

Toll Ticketing—two and one-half years in research before we offered it to you. Retains *both* A and B revenues for companies using it.

Our subscriber PX switchboard systems—the 2-10 and the XY F-40, in particular, which have been a boon to operating companies seeking sources of new revenue at favorable rates.

The "1500" telephone—not only convertible from desk to wall by a 65 cent kit—but, since 1953, a "500" type instrument completely in accord with Bell standards of transmission quality.

The 6K-1 multi-line desk type PBX. Operating companies tell us that, for dollars invested, this system pays the greatest return of any product in the whole world of telephony.

Our new "501" wire-line Carrier—developed over two years of exhaustive studies into your needs, is a practical down-to-earth product.

I'm sure you'll agree, these are all evidences of real progress. I want to remind you that they were made possible by your patronage—especially your orders in the realm of supplies—"bread and butter" items for us both!

John H Voss

Vice President and General Manager
Telecommunication Division

STROMBERG-CARLSON, A Division of General Dynamics Corp., Rochester 3, N. Y.

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

WHILE ADMITTING that routine engineers are a "must" in this technological civilization, creative engineers are the people required to keep the United States technology in a top international position, according to Dr. Joseph Barker, chairman of the board of Research Corp., a non-profit foundation supporting scientific research in colleges and universities.

He further stated that there are "too few" creative engineers available and pointed out that some of the emphasis in a typical engineering education "tends to hinder their development during college years."

Dr. Barker then defines routine engineers as being "the hewers of wood and drawers of water who keep the industrial machine operating." He doubted that they would ever be available in sufficient number to meet the needs of the labor market.

Creative engineers were described as having:

(1) A sound knowledge of present-day engineering practices and a solid scientific background.

(2) A thorough understanding of the latest developments in pure science and technology.

(3) A critically analytical curiosity which constantly asks "Why?" and "Why this way?"

(4) A deep appreciation of the economics of technology procedures—because the dollar sign acts as a primary control in the free competitive, capitalistic system.

o

While flying between Washington and New York recently we noted the tremendous amount of building out in the country and not even near any existing town.

Many housing developments have been completed and others are in the process of construction. New factories, out in the country, are also quite numerous. Some of these were quite small with eight or ten cars parked nearby. Others were large and parking lots have been provided to accommodate thousands of cars.

It would seem that this decentralization of both business and residences will keep the communications business booming for many years into the future.

o

We understand that the length of calls over the transatlantic submarine telephone cable are much longer than had been expected.

It was forecast that the majority of these calls would average only about three minutes. They actually average a much longer time. This, we believe, proves that people are always willing to pay for good service.

•

The New York Telephone Co. cut-over a No. 5 crossbar exchange on a $24 island early last February. This is the first No. 5 crossbar exchange on Manhattan Island although this type is not new to New York boroughs. The No. 5 crossbar has previously been installed in several Brooklyn, Queens and Staten Island offices.

•

The recent announcement that the first exchange in the Bell System to have all-numeral, seven-digit dialing, is being installed at Wichita Falls, Tex., brings to mind some early telephone history of that city. Back when its telephone service was furnished by an Independent company, the *Electrical World*, under date of Oct. 7, 1893, printed the following item from a local Texas newspaper:

"The Wichita Falls, Tex. automatic telephone exchange has been completed and is in full operation with 40 subscribers. In this telephone system there is no central office. Each subscriber makes his own connection with any other.

"The instruments look like the ordinary office telephones except that a box about 10 inches long and 4 inches wide projects from beneath the transmitter, having on its face 14 small keyholes designated by letters of the alphabet. This is the automatic switchboard.

"A key attached to a small chain is normally inserted in X, but may be used in any of the key holes. The lettered holes represent the different wires or circuits, as they are called, in the exchange. Each wire serves three subscribers who have each a certain number of rings for a distinguishing signal.

"Connections are made by taking the key from X and inserting it in the keyhole representing the wire wanted. When this is done, the receiver is applied to the ear to ascertain if the line is in use.

"With the receiver still held to the ear, the proper signal is given and the connection is completed as soon as the called party takes down his receiver.

"This system can be used for exchanges up to 100 subscribers.

"The citizens of Wichita Falls are proud of this modern system, as it is said to be giving them excellent service."

While the Wichita Falls exchange undoubtedly was one of the pioneer Independent systems, there was an earlier one, the automatic system installed in 1892 in La Porte, Ind., by the Strowger Automatic Telephone Exchange of Chicago.

•

Some day it may be possible for voice communication to travel by electronic "shorthand."

The Bell Telephone Laboratories are experimenting with a new technique in which a sample is taken of speech sound—just to identify it—and then it is transmitted by wire to a special receiver that rebuilds the original sound. With this method, voice can be transmitted by means of a reduced number of electric pulsations or signals.

This method, when perfected, will make it possible for more voices to share the wire channel.

XUM

THE Operator's Corner

By MAYME WORKMAN — TRAFFIC EDITOR

DO YOU LIKE TO READ? While it is true, TV has cut into the reading time of many individuals, it is still necessary to read in order to keep in touch with progress, new ideas and developments—and just for the fun of it.

After reading an article by Irving Kiem, "Foundation for Better Reading," it is evident much can be done to improve our reading habits.

If you read the same way you read when you were taught in grammar school (and I'm confident many of us do, thinking we are as good a reader as we can be) according to Mr. Kiem, unless we have learned about a "touch method" of reading now being used by industry and leading universities, there is ample room to improve our reading habits.

Perhaps you are asking yourself why you should be concerned about your reading ability? A person learns to type rapidly and accurately to do a certain job. But no one reads for a living . . . or does one?

The average executive of a company spends 25 per cent of his time keeping up with his trade journals, tax bulletins, Washington Newsletter, newspapers, magazines, and sales reports. Everyone is moving ahead or falling behind in his or her work or social life, depending on reading habits.

Whatever American men and women want out of life is wrapped up in their reading habits. Read a book on building a sailboat. Take a course in night school for advancement. Increase social poise and popularity by knowing more about the world. . . . It's in the books, magazines, newspapers.

But if you ask the next person you talk to after finishing this article, "Have you read any books lately?" the reply will probably be, "I don't have time." You probably say it yourself and feel a little ashamed.

The Foundation for Better Reading in Chicago has trained thousands of business men, students, and people from all walks of life all over the country to read better, faster, and more easily. According to their experts, you need the following qualifications to be a rapid reader:

(1) Age: 13 years to 70 years old.

(2) Vision: Ability to see, with glasses if necessary.

(3) Education: Eighth grade or equivalent.

(4) Desire: A real desire is a must.

(5) Background: No speech difficulty.

According to Irving Kiem, no one can make you a better and faster reader by telling you how unless you practice certain principles until they become habits. If you have great will power, you can practice these principles with no instructions at all. The other alternative is to take a course. Although there are many books on the subject available, they will not provide the help given by a training aid.

The whole idea is for the reader to learn to read *groups* of words instantly instead of reading each word *separately*. The technique is a recognized one. It was used during World War II to teach aircraft identification. At that time, however, the slides contained plane silhouettes and they were flashed by a huge projector on a screen. Flyers and gunners were able to see the whole plane at a fraction of a second and remember it more easily than trying to recognize individual parts of the plane.

Most people learned to read properly in the early grades and have not received any reading training since. They read 200 or 300 words a minute when they could read 600 to 800 words a minute. There is a hidden potential of 80 per cent unused reading power which can be released with training.

In this fast moving era, perhaps we should give more thought to our reading habits in order to derive the full benefit from the small amount of time we are able to salvage from our 24 hour day for this purpose.

Reading brings knowledge, and some one has said, knowledge is power. Every time we read something worthwhile, we add to our fund of knowledge. This in turn makes us a better worker and conversationalist. It is always amazing to find people who never read, not even the daily paper. Such people are usually lonely souls, especially older folk who are confined to their homes or to rest homes. They are out of touch with the world and age much more quickly than is necessary.

Telephone operators do a considerable amount of reading at the switchboard, entries on toll tickets, for example, and to the operator who is able to read a group of words simultaneously, a report entered on a ticket is grasped instantly and she is able to proceed with the call.

Traffic Questions

(1) At an Official Board, if the operator receives a call for the manager by title, should she establish the connection?

(2) At an Official Board, if a customer says, "How do I arrange for telephone service?" or "I want to talk about my bill," how should the operator proceed?

(3) If a customer tells the Official Board operator there is a mistake in his bill, stating he is sure the amount shouldn't be so much, what action should be taken by the operator?

(4) How should the Official Board operator acknowledge a customer's order?

(5) If an Official Board operator receives a call by name for the manager, or if the customer wishes to speak to the manager personally, what should the operator say?

Answers are presented on page 32.

XUM

Maintenance Testing Equipment

By JOHN A. BRACKEN

PART 80. The preceding article in this series appeared in the May 4 issue, page 33.

THE TELEPHONE induction coil operates on the principle of mutual induction. When an EMF is induced in the coil secondary winding as a result of varying magnetic lines of force in the primary winding, it is possible to transform the low EMF flowing in the primary into a higher EMF in the secondary.

The value of the EMF induced in the secondary depends on:

(1) Physical properties of the coil.

(2) Ratio that exists between the number of turns of wire in the primary and secondary windings.

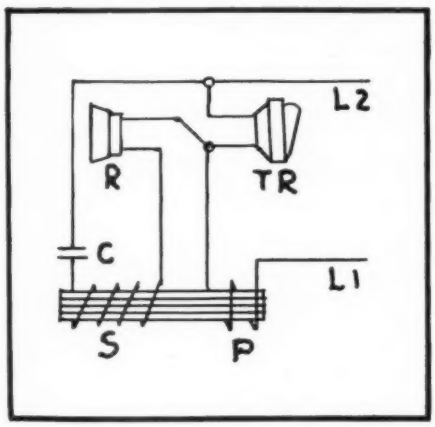


Fig. 1

(3) Number of lines of magnetic force which cut the windings.

(4) Rate of change of the magnetic force produced by the primary winding.

(5) Frequency of the primary current.

Fig. 1 shows a schematic diagram illustrating the action of mutual induction in a telephone circuit. Direct current from the telephone line at point "L1" flows through the induction coil primary winding "P" and transmitter "TR," then back to the line at point "L2."

This direct current (the voice current) remains nearly constant until the transmitter is spoken into and its diaphragm is caused to vibrate. The vibrating action of the diaphragm produces the effect of a variable frequency current in the primary winding that changes in accordance with the variations of the speaker's voice. It also induces a current in the secondary winding "S," having the same variable characteristics. This current flows through the receiver "R," which reproduces the words spoken into the transmitter.

Fig. 2 represents a schematic diagram of an anti-sidetone telephone circuit wherein the electromagnetic action of the induction coil is fundamentally the same as in *Fig. 1*.

On incoming transmission from the line, there is a difference of potential existing across the receiver and current flows in the receiver. However, for outgoing transmission, in order to suppress sidetone effects in the receiver, a third (tertiary) winding "T," called the balancing winding, and a balancing network "B" are incorporated in the induction coil.

In this arrangement, the telephone receiver is connected across points associated with the tertiary winding and balancing network in such manner that on outgoing transmission the EMF induced in the tertiary is equal to the potential drop across the balancing network. With this condition the EMF across the receiver is said to be zero. This arrangement prevents undesirable sidetone.

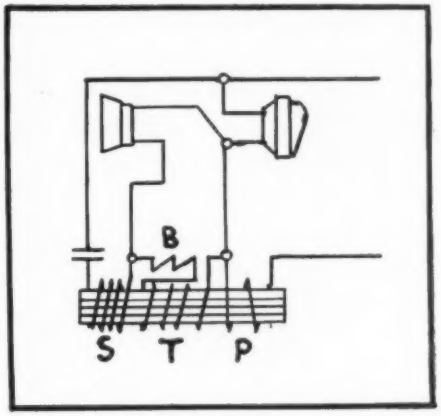


Fig. 2

Perhaps this problem will be better understood by reference to *Fig. 3*. Here we have a parallel-series network, so arranged that an electrical balance is obtained between points "X" and "Y."

Current from the battery flows through the resistors, but not in the voltmeter. The voltmeter needle remains at zero, indicating that the potential drops are the same across the resistors, and no potential difference exists between points "X" and "Y"; consequently, there can be no current flow through the voltmeter between these points. The principle advantages of the anti-sidetone telephone are:

(1) High operating efficiency, which results in low transmission loss.

(Please turn to page 32)

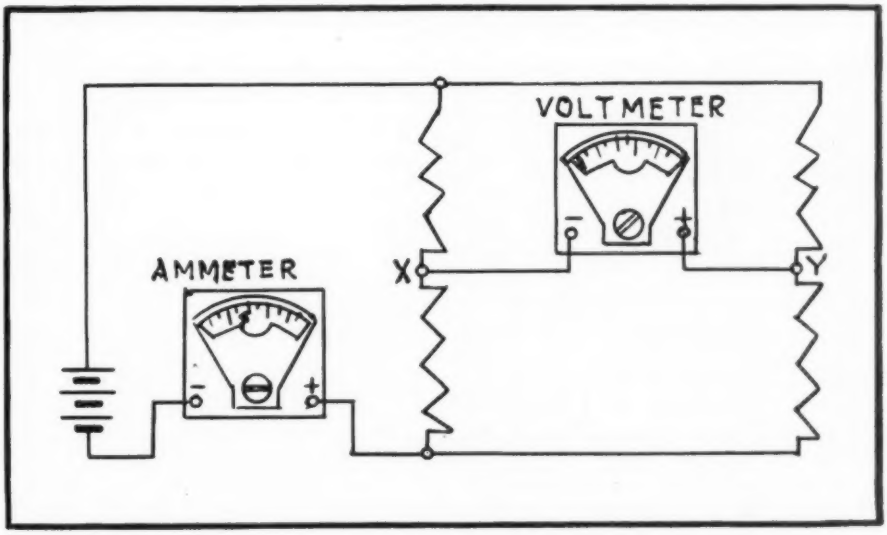


Fig. 3

Courts and Commissions

Two N. Y. Companies Get Rate, Financing Approval

The New York Public Service Commission on Aug. 8 accepted a tariff amendment filed by The Chenango & Unadilla Telephone Corp. of Norwich designed to increase rates by an estimated $139,800, effective with billings made on and after Aug. 10.

The company serves about 27,000 telephone stations through 34 central offices. The new rates will apply to subscribers of all exchanges except those at Clayville where toll-free service to Utica is provided, and at Chenango Bridge where toll-free service to Binghamton is provided. Rates now charged at Clayville and Chenango Bridge are the same as apply to New York Telephone Co. subscribers in Utica and Binghamton respectively, and will be continued.

Chenango & Unadilla Telephone Corp. was formed in 1922 as the result of the merger of three small companies. It has since acquired ownership of 19 adjacent companies, many of whose plants were in need of rehabilitation. As a result of an extensive modernization program undertaken in recent years at a cost of several million dollars, 22 of the company's 34 exchanges and 75 per cent of its subscriber stations have been converted to dial operation. Plans are now underway for the conversion of 10 more exchanges.

In filing its new rates, the company said that additional revenues were needed to offset major increases in operating expenses, and to enable it to continue adequate service.

•

The Commission also authorized Highland Telephone Co., of Monroe, to issue new securities aimed at producing $999,875. (TELEPHONY, July 27, p. 42.) Included will be 6,795 shares of no par value common stock, of which 2,350 shares will be sold at $42.50, and 4,445 shares will be reserved for conversion purposes; $200,000 in 4 per cent 15-year convertible debentures, and $700,000 in 5¾ per cent 25-year first mortgage bonds.

Proceeds of the new securities will be used to discharge short-term debt obligations aggregating $900,000 incurred by the company during recent months in order to finance plant expansion and improvement programs, with the balance to be used to finance additional plant improvements.

The company provides telephone service to about 9,000 main stations in and near Monroe, Washingtonville, Highland Mills, Maybrook, Chester and Goshen. Except for the Goshen exchange, which was purchased by the company late last year, all exchanges now provide dial service. Plans are now underway for conversion of the Goshen exchange.

The company contemplates the expenditure of about $427,500 this year for construction of new automatic central office and central office buildings in Goshen and the installation of automatic toll ticketing equipment which will permit direct distance dialing through all of its exchanges.

In a report to the commission, Examiner William T. Wilkinson states that the company proposes to sell its new shares of stock and the debentures to residents of its service area, with present shareholders being given preemptive rights to purchase them initially. The mortgage bonds will be sold to Berkshire Life Insurance Co., Bankers Life Insurance Co., and The Fidelity Life Insurance Co.

Wis. Commission Schedules Two Rate Applications

The Wisconsin Public Service Commission's calendar for the week of Aug. 12 included:

Mosinee Telephone Co.'s request to raise rates (Aug. 15).

Bruce Telephone Co.'s application to increase rates for local paystation calls (Aug. 16).

La. Company Asks Raise

Forest Hill Telephone Co., Alexandria, was reported on July 27 as seeking a rate increase from the Louisiana Public Service Commission.

Georgia Company Given OK For Loan, Purchase, Rates

The Georgia Public Service Commission on July 25 authorized the Dixie Telephone Co. to borrow an additional $170,000 from REA; also to issue and sell 104 additional shares of $100 per share par value common stock. The proceeds from loan and stock sale will be used to acquire the Alamo Telephone Co. and to expand and convert these facilities to dial operation.

The commission authorized the following rates at Alamo, following conversion:

One-party business	$6.75
Two-party business	5.75
Four-party business	4.75
One-party residence	4.25
Two-party residence	3.50
Four-party residence	3.00
Rural multi-party business	5.25
Rural multi-party residence	4.25

SB T&T Asks to Raise S. C. Intrastate Toll Rates

In an application filed on Aug. 2, before the South Carolina Public Service Commission, the South Bell Telephone & Telegraph Co. presented a revised schedule of intrastate long distance rates.

The new rate schedule would result, in general, in lower rates on station-to-station day calls lasting two minutes or less, and lower rates and a longer initial period of four minutes on evening, night and Sunday station calls, J. H. Fleming, South Carolina commercial manager, said.

Under the new rates, day station-to-station charges would be based on a two-minute initial period, doing away with the former three-minute period, while the night and Sunday call period would be increased to four minutes.

Overtime charges will be computed on periods of each additional two minutes, for night and Sunday calls.

Mr. Fleming said that under the new system, slightly higher rates are proposed for person-to-person calls and an extra charge would apply on collect station calls.

XUM

The new long distance rate schedule was designed, in line with a long-range mechanization program, to more adequately meet the needs and desire of businessmen for a shorter initial period at a lower basic rate and of residence users for a longer initial period for family or social calls at night and on Sunday, Mr. Fleming said.

Rejects More Ship-to-Shore Service on Lake Michigan

The Wisconsin Telephone Co.'s request to provide ship-to-shore radiotelephone service on Lake Michigan was given a setback on Aug. 8 when a Federal Communications Commission examiner at Washington, D. C., recommended denial of the proposal (also see *In the Nation's Capital*, by Francis X. Welch, this issue).

Examiner Basil P. Cooper said the application failed to show any demand by lake cargo vessels or yacht owners for additional radio-telephone service. Service is provided now by a station at Port Washington, operated by the Lorain County (O.) Radio Corp.

A Wisconsin Telephone Co. spokesman said that the company had requests from ship and yacht owners for the service and thought they would receive more requests when the St. Lawrence Seaway is finished. The company had asked to build stations here and in Green Bay.

North Carolina Company Granted Increase in Rates

The Concord Telephone Co. was authorized by the North Carolina Utilities Commission on Aug. 8 to increase its rates to provide an additional $145,189 in net operating income, required to realize a "fair" 6 per cent return on its investment. (TELEPHONY, June 8, p. 39.)

At the same time the Commission expanded base rate areas to include "contiguous" areas in the major exchange centers of Concord, Kannapolis and Albemarle. In Kannapolis the base rate zone will include 2,500 telephones formerly outside the base zone.

The commission also granted the company its first certificate of public convenience and necessity, stating that it was being issued "to remove any cloud of doubt" about the company's territory.

Under the rate order, present rates and charges will be increased to produce an additional gross operating revenue of $342,325.

The new rates apply to all of the company's exchanges and will be reflected in statements mailed to subscribers on Sept. 1.

The company operates exchanges at Concord, Kannapolis, China Grove-Landis, Albemarle, Harrisburg, Mt. Pleasant, Badin, Oakboro and New London.

Free service between Kannapolis and Landis-China Grove, and linking Concord with the Mt. Pleasant and Harrisburg exchanges will be continued.

The company had asked rate increases sufficient to produce annual net operating income of $182,760, but the commission ruled that this would have provided total net operating company income of $389,216 on a net investment of $5,840,322—a 6.66 per cent rate of return.

Stating that fixing a fair rate of return for utilities "will vary with the particular circumstances," the commission said in its order that it is "readily apparent" that Concord Telephone's earnings "under present rates and charges are grossly inadequate." It added that the company's present rate of return on net operating income to net investment was only 3.48 per cent.

Rates for all exchanges were set by the commission as:

Business service: one-party, $8.50; two-party, $7.00; four- and five-party, $6.00; and multi-party, $6.00; Residence service: one-party, $4.25; two-party, $3.75; four- and five-party, $3.25; and multi-party, $3.25.

In addition to the basic rate, the following mileage charges will apply in connection with main stations; one-party or PBX trunk line per ¼ mile or fraction thereof, 63 cents; two-party, 32 cents; and four-party, 16 cents.

The commission states that the new rates "will produce gross revenues in an amount sufficient to permit the petitioner to pay all of its operating expenses, pay its taxes, adequately finance its capital structure and, in addition thereto, add to its surplus amounts necessary to attract additional capital for future expansion and improvement."

The certificate of convenience and necessity was issued because the company began service prior to 1900 when state law made no provision for such certificates.

Virginia Independent Sells 12,000 Shares of Common

All 12,000 shares of additional common stock in the Tidewater Telephone Co., recently offered stockholders and employes who are Virginia residents, have been subscribed, Rodney M. Coggin, president of the company announced on Aug. 5.

A group of investment bankers headed by Galleher & Co., Inc., underwrote the issue for sale to the public at $23 a share, subject to stockholder and employe rights. The stock, with a par value of $20 a share, was subscribed by employes and stockholders at $21 a share, it was reported.

Galleher & Co. said underwriters had received orders from non-stockholders totaling more than one-third of the new issue. Proceeds from the sale will be applied to reduction of Tidewater's temporary bank loans, which were incurred for capital improvements and additions to its system.

New York Company Given Permission to Sell

The New York Public Service Commission on Aug. 9 authorized Schoharie Telephone Exchange, Inc., to transfer its franchise, works and system to The Middleburgh Telephone Co. by Sept. 30 (TELEPHONY, June 22, p. 38). No financial consideration is involved since Middleburgh Telephone purchased all of Schoharie Telephone's outstanding stock in May.

Schoharie Telephone Exchange now provides service to about 670 telephone stations in and near the village of Schoharie through magneto and common battery switchboards. Its service area includes portions of the towns of Schoharie, Middleburgh and Wright.

Middleburgh Telephone furnishes dial service to about 1,400 stations through exchanges in Middleburgh, Franklinton, Breakabeen and Bramanville.

At a public hearing on the proposed property transfer, Middleburgh officials testified that plans are now under way for the conversion of Schoharie Telephone's system to dial operation in about two years. The cost of that work is estimated at about $150,000. The 10-cent toll charge for calls between the systems of the two companies will be continued until after Schoharie's plant has been converted.

Two Independent Companies Sold to Wisconsin Bell

Sale of the Menomonee Falls and Lisbon Telephone Cos. to the Wisconsin Telephone Co. was approved on July 18 by the Wisconsin Public Service Commission. (TELEPHONY, Feb. 9, p. 46.)

The application of the two companies for approval included a request by the Wisconsin Telephone Co. to apply its rates and rules to the acquired subscribers. The commission denied the request, which would have amounted to a rate increase of about 75 cents per station on business telephones and 25 cents on home telephones.

The transaction must now await ap-

proval of the Federal Communications Commission.

Harold Mather, division commercial manager of the Wisconsin company, said an automatic system is contemplated for Menomonee Falls but it will be about two years after acquisition before dial telephones will go into service here.

The Falls telephone company furnishes service to approximately 3,100 stations through exchanges at Menomonee Falls and Germantown. The Lisbon company serves about 516 stations through an automatic exchange at Sussex.

Ill. Independent Sues for Destruction of Property

A complaint has been filed in Macoupin County Circuit Court, Carlinville, Ill., by Modesto-Scottville Telephone Co. (Galen J. Gibbs, president and manager), against Caldwell Engineering Co. and Ankron Construction Co.

The plaintiff alleges that on Sept. 25, 1956, the defendant companies were widening and resurfacing a road north from the village of Scottville to the Macoupin-Morgan County line, and while they were working on the road bridge known as Big Apple Creek, it is alleged that the defendant companies wrongfully and negligently destroyed plaintiff's telephone poles and telephone wires by bulldozing the poles out of the ground and burning the poles and wires.

The defendants requested the plaintiff to rebuild and reroute their lines from Apple Creek, which was done, and then those lines were destroyed by the defendants and their agents, it was stated. It is also claimed they felled trees and brush upon the lines and poles of plaintiff, interrupted the telephone service to such an extent that the plaintiff was forced to dispose of the company.

The defendants were requested to desist and at one time the sheriff of Macoupin County answered the plaintiff's call requesting help in stopping the destruction. The plaintiff seeks damages in the amount of $539.90 and costs of suit.

Sale of Two Independents OKd by Minn. Commission

The Minnesota Railroad & Warehouse Commission on Aug. 5 authorized the following purchases:

Sale of the entire property of Middle River Telephone Co., by Emil Peterson, owner, to the Middle River Telephone Co., Inc. The company serves about 65 stations.

Sale of the entire property of the Prinsburg Farmers Mutual Telephone Co. to Minnesota Central Telephone Co., Hector, Minn. The Prinsburg company serves about 270 stations.

Two Missouri Companies Ask Permission to Finance

Two Missouri telephone companies on Aug. 6 filed requests for authority for financing. The Triangle Telephone Co. applied for permission to issue 300 additional shares of common stock of no par value and 500 shares of noncumulative 6 per cent preferred stock of $50 par.

The Twin Lakes Telephone Co. asked to issue its notes and trust indenture for $100,000 to Stromberg Carlson, a division of General Dynamics Corp.

Authorizes Oregon Sale

The Panhandle Cooperative Telephone Co., Halfway, on Aug. 7 was authorized by the Oregon Public Utility Commissioner to sell its system to Ernest E. Huff. Mr. Huff is a director and general manager of the Panhandle co-op and is owner and operator of the Pine Telephone System, which is adjacent to the area served by Panhandle. The Panhandle system provides service to about 294 subscribers.

Answers to Questions On Page 28

(1) No. The operator should determine whether the matter he is calling about can be handled by the service representative by saying, "Are you calling about your service?"

(2) On such calls, whether or not he has given his number, take action to direct the customer to the proper line.

(3) The operator should say for example, "If you will give me your number, I will connect you to our service representative."

(4) After the operator has ascertained the station to which the call should be directed, she should acknowledge the request with a phrase that fits naturally into the exchange of remarks and conveys the impression that the operator understands the customer's wishes and will take action regarding them.

(5) Say, for example, "Mr Hill's line is busy. Will you speak with his assistant, please?" and proceed as directed.

MAINTENANCE TESTING

Continued from page 29

(2) Practically eliminates the effects of sidetone over a wide range of line loop conditions.

(3) Presents a quieter listening condition to the ear, due to the interfering masking sound of local and room noise being reduced to a minimum.

(4) Helps the telephone user to talk automatically at a more normal tone of voice without conscious effort to raise the voice level above that required for the highest degree of transmission efficiency.

At times telephone induction coils develop electrical and magnetic (path of lines of magnetic force) circuit trouble that will cause impairment in transmission.

Some trouble which may affect the proper operation of a telephone induction coil are:

(1) Open primary, secondary or tertiary winding, in which event, the inductive effect of the winding is destroyed.

(2) Short-circuited winding. In case of either a short-circuited primary or secondary winding, the customer may complain of being heard indistinctly. With a short-circuited tertiary winding, he cannot hear at all.

(3) Crosses. The effect of a cross between the coil windings is to greatly reduce transmission, due to the fact that the voice currents which ordinarily pass through the secondary winding, capacitor and receiver are shunted by the cross circuit.

Note: Open, short-circuited or crossed windings can be detected by means of an ohmmeter and application of the point-to-point testing method referred to in Part 75 (TELEPHONY, Sept. 3, 1955, page 31).

(4) Induction coil improperly connected in the telephone set.

(5) Incorrect electrical balance between the windings.

(6) Low power supply voltage to the primary winding.

(7) Lightning finding its way into the coil and damaging the windings.

(8) The resistance of the line loop being so high as to decrease the direct current flow in the induction coil primary winding to a point below the required operating values.

(9) A line loop condition existing which disturbs the proper balance in an anti-side induction coil and causes excessive side tone in the telephone receiver.

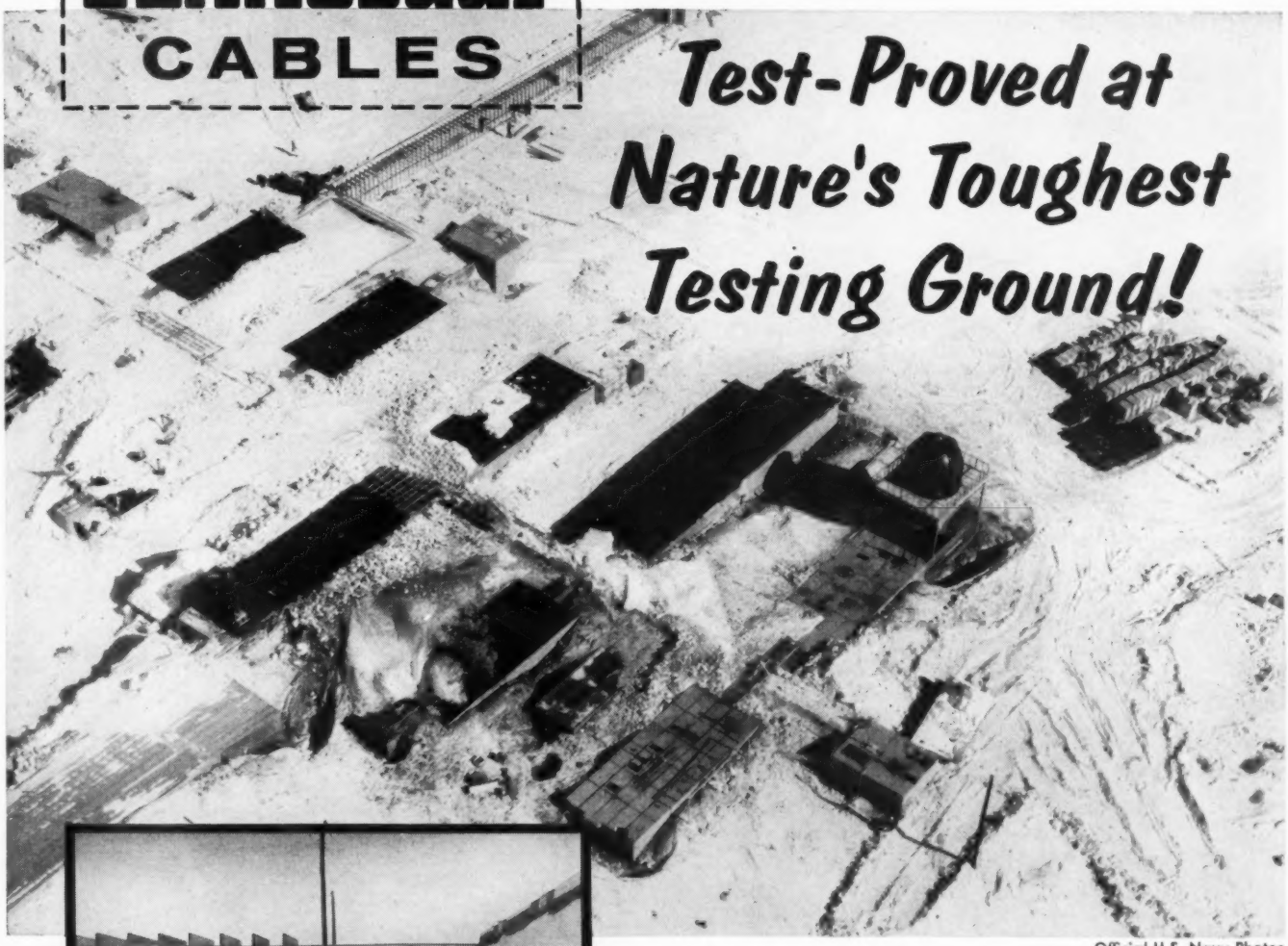
(10) A condition which may affect

(Please turn to page 36)

ANSONIA®

Ankoseal CABLES

Test-Proved at Nature's Toughest Testing Ground!



Official U.S. Navy Photos

In Antarctica, reliable communications are vital to the success of Operation Deepfreeze. The lives of men and the safety of equipment *demand* accurate transmission of information and instructions.

Ankoseal Rural Distribution Wire was specified for telephone, intercom and control circuits because it is simple to install, easy to maintain, and adaptable to emergency service. Indoors at Little America V, this versatile wire is strung from rafters in snow covered tunnels and buildings . . . outdoors it is strung on poles and sometimes it is simply laid on the snow. Under all conditions this Ansonia wire has passed every rigorous test!

Ansonia Ankoseal Cables are engineered to meet your most exacting requirements. They are built up to a standard, not down to a price. Whenever you require *dependability* . . . specify *Ansonia Ankoseal Cables.*

Aerial and Direct Burial Cables

Self Supporting Cables

Inside Wiring Cables

B.U.G. Cables

Parallel Line Wire

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THE ANSONIA WIRE & CABLE COMPANY, ASHTON, R. I.

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Ankoseal

The Oldest Name In Plastic Cables In The Most Modern Plant Devoted Entirely To Producing Plastic Cables.

"Looks like they made

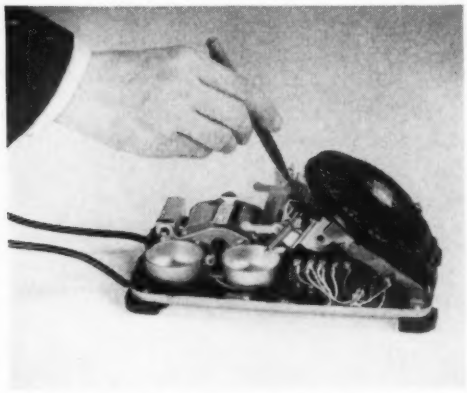
e it to last forever!"

The first time you peek inside Automatic's Type 80 Monophone, you're *sold!* You're convinced that here's a telephone that's built to last.

Following are a few simple tests that will convince you even further:

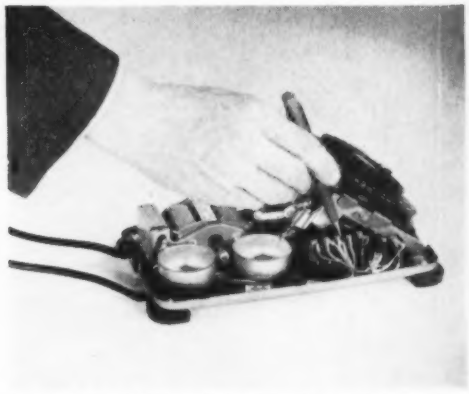
ake off the housing—and don't be gentle ith it! Flex it this way and that; it can take ard handling without cracking.

2



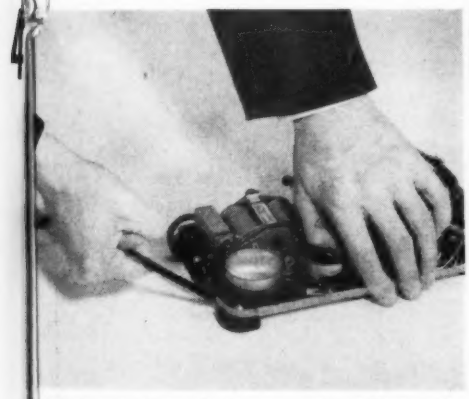
Check the twin contacts and dust covers on the sturdily-built hookswitch and the smooth-working dial. They'll keep servicing down!

3



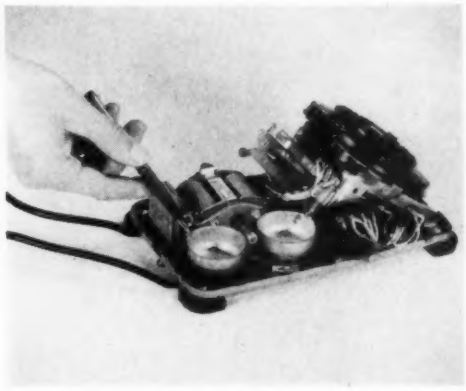
Look at the balancing network unit. It's completely moisture-sealed—could be kept under water for years and still work without the slightest trouble.

4



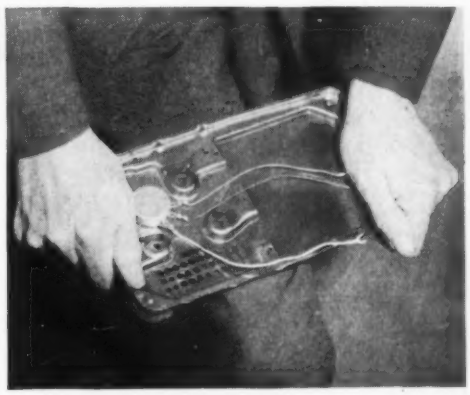
wist the cord, yank it, scrape it—it'll stay in ood shape. It's long-wearing, kink-resistant, nisture proof.

5



Examine the ringer, too. It's sensitive and dependable, built to ring true through long years of hard use—can be removed with only a screwdriver (like all Type 80 components).

6



Try to bend the baseplate. It's a strong, heavy piece of metal. It stays rigid, keeps every component perfectly aligned.

Every day more customers are trying tests like these—
and signing very nice orders as a result. Which they never regret.
For Type 80 Monophones keep their maintenance down,
and please their subscribers mightily. They will do the same for you.
Why not send your order in today? Address:

Automatic Electric Sales Corporation, Northlake, Illinois.
Or call FIllmore 5-7111.

AUTOMATIC ELECTRIC

A member of the General Telephone System—One of America's great communications systems

GENERAL SYSTEM

XUM

the induction coil magnetic circuit is the relative permeability (comparable to conductivity in an electric circuit) of the iron or steel used in the core to the magnetizing force.

In dealing with troubles in the telephone induction coil electrical circuit, the current flow and various resistance values of the coil windings must be accounted for, whereas in the magnetic circuit, the flow of the magnetic lines of force (analogous to the flow of current in the electric circuit) in the core and the reluctivity (analogous to resistance in the electric circuit) of the material used in the core and the reluctivity of the air only need be considered.

In this respect, it should be understood that the main portion of the reluctance in the magnetic circuit is in the air gaps.

For example, in the open-core-type induction coil, some of the magnetic lines of force induced in the core instead of following the magnetic path through the core, must pass through the air between the core magnetic poles.

This magnetic path through the air (magnetic leakage) is in parallel with that through the core and the number of lines of magnetic force flowing through the air circuit, will depend on the relative reluctance of the two magnetic circuits just the same as in the case of resistance to current flow in two electric circuits in parallel.

When induction coil trouble cannot be readily detected by means of an ohmmeter or other testing procedure, replace the coil with a new one. However, before doing so, it is good practice to determine definitely whether the actual trouble is due to a faulty condition elsewhere in the telephone or on the line.

(To Be Continued)

Incorporate Ill. Company, Authorize Stock Issue

Charles F. Carpentier, Illinois Secretary of State, has issued a charter to the A. and G. Telephone Co., it was reported on Aug. 7.

Paul W. Allen, James W. Green and Margaret B. Allen were listed as incorporators and authorized to issue 2000 shares of stock at $10 per share.

Charter Kentucky Company

Irvine-Ravenna Telephone Co., Irvine, was granted a charter on July 19 by the Kentucky secretary of state. Incorporators were Daniel B. Corman, Glasgow; June Bertram, Louisville, and Nat Ryan Hughes, Murray.

Minnesota and Nebraska Proclaim Telephone Week

The governors of Minnesota and Nebraska are the eighth and ninth state heads to issue a proclamation setting aside the week of Sept. 8 to 14 as Independent Telephone Week (TELEPHONY, Aug. 3, p. 35).

States previously issuing such proclamations are: Florida, Indiana, Maryland, Missouri, Ohio, Oklahoma, and Tennessee.

IN THE NATION'S CAPITAL

Concluded from page 20

is not necessarily final. It could become final if no appeal were taken to the full commission within 40 days after the decision was released, which was Aug. 7, 1957.

If such an appeal is filed, however (and that seems likely, in view of the importance of the case), final decision will have to come from the full commission.

Chinese Telegrams

Will Western Union's "Desk-Fax" prove to be an answer to the old communications problem of sending a telegram in the Chinese language? "Desk-Fax" is a facsimile transmission, by electronic process, of any written message.

Last week, Shu-liang Chiang, an official of the Taiwan Telecommunications Administration (Republic of China on Formosa), told Western Union officials that he thought the age-old stumbling block for sending telegrams in Chinese had been removed by this electronic device—which simply sends the complete image of the written message and re-produces it at the terminal station as faithfully as a photostatic copy. He said he thought that Taiwan businessmen could now send telegrams in their own handwriting.

Use of the Chinese language for normal telegraphic transmission has heretofore been impractical because the language uses more than 9,000 written characters. Some limited transmission has been accomplished by coding and decoding these characters into a series of four-digit numbers. But the results have never been satisfactory and the telegram has, accordingly, been little used by Chinese and other Oriental peoples using similar written forms of many non-alphabetical characters.

Mr. Chiang is visiting the United States to study communications methods.

FCC Orders

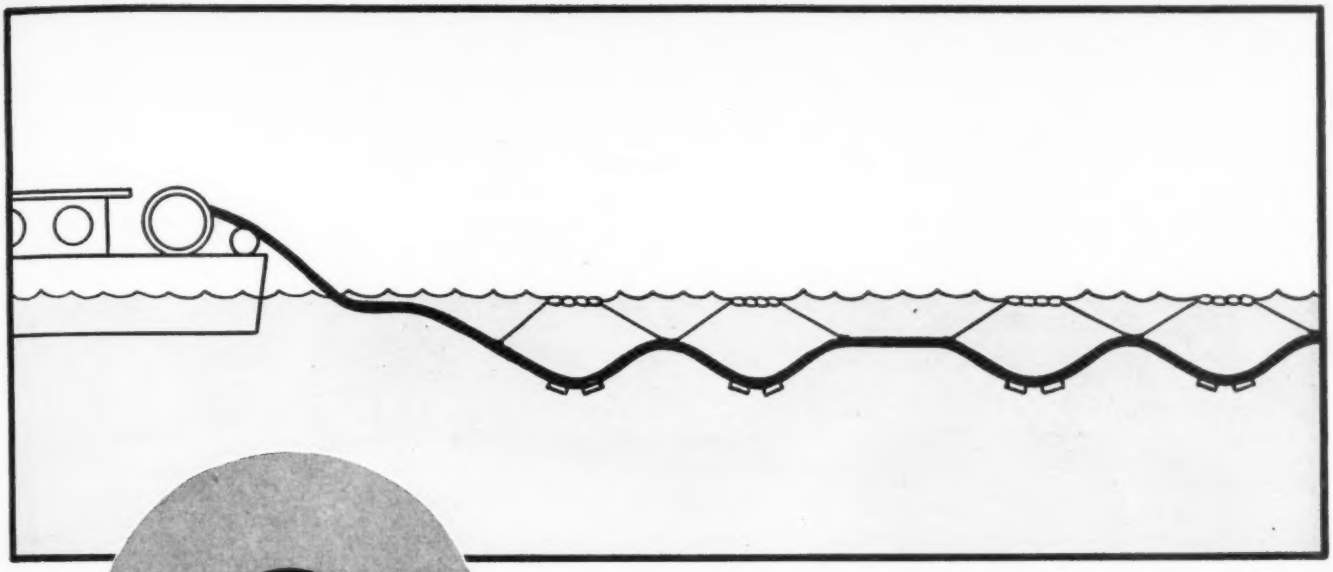
The FCC by unanimous action on Aug. 1 (6-0; Commission Frederick W. Ford was not confirmed until Aug. 2) has prescribed new depreciation rates for various classes of station equipment in the Bell System. These orders affect all of the operating companies of the Bell System, including the Long Lines Department of the American Telephone & Telegraph Co., Cincinnati & Suburban Bell Telephone Co., and Southern New England Telephone Co. The depreciation rates will be retroactive to Jan. 1, 1957.

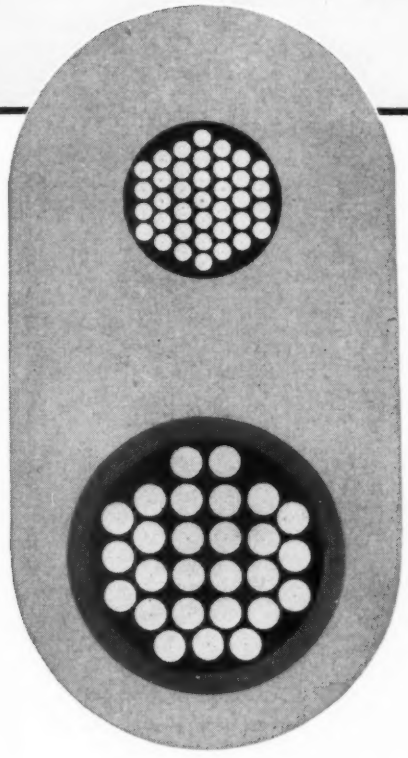
These orders carry out certain amendments to the commission's rules, adopted last year, which have a direct bearing on depreciation rates for telephone instruments, teletypewriters, and other categories of station equipment, including station connections—a new depreciable class of property established under the amended rules. While the new depreciation orders are mandatory as of Jan. 1, 1958, the retroactive effect for a year previous is optional. But all the Bell companies have taken advantage of this option.

The commission also ordered revisions in the depreciation rates previously prescribed for the New Jersey Bell Telephone Co. These provisions reflect both reductions and increases in the individual classes of property, but the over-all effect is a net increase of $1,638,000, or 6.9 per cent, in the company's annual depreciation charges.

The New Jersey company was also ordered to keep the commission informed every year on the latest developments and progress in carrying out its plans for replacing present electromechanical types of dial central office equipment with electronic and other switching systems.

Another order of the FCC, which will be of interest to some Independent companies subject to FCC jurisdiction, deals with applications for the purchase or construction of interstate telephone, cable, or radio facilities. Under Sections 214 and 319 of the Communications Act, applications must be made to the commission for approval of such construction or purchase of interstate communications facilities. But heretofore the commission has delegated authority to grant such approval to the chief of its common carrier bureau on projects amounting to less than $500,000. This delegation of authority to the chief of the common carrier bureau has now been increased so that he can now handle applications for projects amounting to "less than 2 million dollars."





This cable, called Vector Distributed Buoyancy Floating Cable "floats" with pressure-sensitive phones submerged at about a 12-foot depth. The stress-core and multi-conductor electrical cable are continuously extruded side by side in a sheath of cellular polyethylene with extreme lightweight and buoyancy. Thus, one thousand feet of "floating" cable weighs only 725 lbs., and can be wound on a reel only four feet in diameter.

Insulated with BAKELITE Brand Polyethylene,

this telephone cable floats!

Special cable used for seismic recording for offshore oil exploration is an unusual example of the versatility and efficiency of wire and cable insulation made of BAKELITE Polyethylene. The new floating cable has demonstrated more than three times the useful life of older types.

Lightweight, highly inert to chemicals, salt water and corrosive atmospheres, tough and flexible, insulation made of BAKELITE Brand Polyethylene is your assurance of dependable performance.

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BRAND
POLYETHYLENE

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BAKELITE COMPANY, *Division of Union Carbide Corporation* 30 East 42nd Street, New York 17, N. Y.

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XUM

ADVANTAGES OF EXTENDED AREA SERVICE

Continued from page 24

the extended area offering will meet the needs of the general body of customers rather than the needs of only a small minority group of subscribers. However, I'd like to caution any of you who might make such a study to be careful about interpreting the results in terms of customer acceptance.

For example, let's suppose that you are considering an extended area plan that involves increasing the monthly rate for residence service by $1.00. Your study of individual customer's bills indicates that only 30 per cent or 40 per cent of the residence customers will save money or break-even, and that the majority will be paying more under the plan you have in mind than they do now. Do not conclude that only 30 per cent or 40 per cent will be in favor of your plan; to the contrary our experience has been that if you tell your customers about the advantages of your plan, it is much more likely that 70 per cent or 80 per cent of them will be in favor of it.

The truth is there are a good many people who, for example, don't permit their children to make toll calls except by special permission, but these same people would be more than willing to pay the $1.00 per month and not have to worry about restricting their children's use of the telephone. And, there are others who would like very much to receive more calls from relatives and friends in the nearby community.

And, there are still others who will say "I don't make many calls, myself, but it sounds like a good thing for our town, it's a step forward, and if the majority want it, I'm in favor of it, too!"

(2) *Customers Expressed Desires for Extended Area Service.* These come to us in a number of different ways, for example, through newspaper stories and editorials, the activities of civic organizations, requests of municipal officials, petitions addressed either to the company or the commerce commission, and complaints or inquiries from customers.

Regarding the last mentioned, the complaint may take the form of a request to revise an exchange area boundary in order to eliminate toll charges. Subscribers' pressure to revise an exchange area boundary has frequently been the motivating influence in our considerations of an extended area plan.

Survey Favors EAS

(3) *Customer Opinion Surveys.* In connection with all of Illinois Bell's recent applications to the regulatory bodies for authority to introduce extended area service, we have attempted to secure some measure of the attitude of the public by making customer opinion surveys. These have been handled in a number of ways, among them (1) by letter and postcard reply, (2) letter with a follow-up contact, either a telephone call or visit, and (3) entirely by personal contact.

Our general experience has been that the personal contact method has elicited the most favorable responses, and the non-personal contact (that is the letter and postcard reply) not as favorable.

We have found that community leaders who are familiar with extended area offerings and recognize the advantages to customers, can be very helpful to us because their thoughts and opinions have considerable influence on the general body of customers in the community.

(4) *Economic Relationships Between the Communities Involved.* Where a large number of people in one community are employed in the other, do their shopping or marketing there, or depend on the other community for medical and other professional services, there is likely to be a strong desire for extended area service.

(5) *Common School Districts.* Our teen-agers attending high school or junior high school, and sometimes grade school too, in another community, establish ties that carry over into telephone use. It is worthwhile remembering that these youngsters are our future subscribers.

(6) *Opinions of Local Telephone People.* One of the best sources of opinion as to the desirability of extended area service are the telephone people in charge of furnishing service in the communities involved. The thoughts and opinions of these people are important, and can be very helpful in reaching a decision. The local telephone people are familiar with the working habits and social ties of the citizens in the communities involved. For example, they will know where the customers in their community are employed, where they shop, what hospitals and medical centers they use, where they attend church and where they send their children to school.

These telephone people sometimes can call attention to a particular situation that may change in the near future. For example, they have had discussions with school authorities and learned that a community which does not now have a high school is definitely planning to establish one of its own, and consequently the telephone interests of that community may be substantially affected when such action is taken.

Trips Worthwhile

In addition to sounding out the local telephone people for their opinions, it will also be even more worthwhile to make an actual trip with them through the areas involved. From such a trip, first-hand observations can be made of the locations of the communities involved, their proximity to one another, highways and roads connecting them, new and potential real estate developments between them, concentration of homes near the exchange boundary line and other factors having a bearing on the problem. These first-hand observations will help those charged with the responsibility of evaluating customers' reaction to the offering of extended area service.

(7) *Revenue Effects, Rate Levels and Cost Effects.* These three effects are so closely tied together that they must be considered collectively as well as individually. With extended area service, there will, of course, be a reduction in toll revenues, and one method of offsetting this reduction is to set higher monthly rates. The higher monthly rates are justified since customers will have the benefit of larger local calling areas, and value is thereby added to their service; they will be able to make calls to and receive calls from not only customers in their own community, but also customers in other exchanges as well.

The added value comes both from the increased number of telephones available at local rates and the longer distances over which local calls may travel.

I'd like to go back to one statement I made a few moments ago and qualify it. I said that with extended area service, there will, of course, be a reduction in toll revenues. It would have been more accurate to say there will be a temporary or partial reduction in toll revenues.

There are apparently a good many people who begin making more toll calls to other places after an extended area calling plan has been introduced. Perhaps these customers, now that they no longer have to pay tolls to the nearby town which has been added to their local calling area, have a stronger desire to make calls to other points.

In any event, our experience seems to bear this out: That there is some recovery in toll revenues following the introduction of extended area service.

(Please turn to page 41)

Here's what happened when the Ashtabula Telephone Co. changed to Recordak Toll Billing

BILLING an average of 70,000 toll calls a month to its 11,000 subscribers was becoming more and more of a bookkeeping problem! *How could microfilming help?* A Recordak Reliant Microfilmer was installed which microfilms up to 400 items per minute — results were immediate.

Toll tickets microfilmed at a 400-per-minute clip!

Now, toll tickets are photographed . . . no need to show individual items on bill . . . instead, toll tickets are attached to a statement showing total charges . . . then, sent on to customers as bill.

Reaction is 100% favorable

Commercial subscribers find they can allocate costs much more easily with toll tickets in hand.

Home subscribers—and especially those with teenagers in the family—are all for it, too. It takes the "mystery" out of telephone charges.

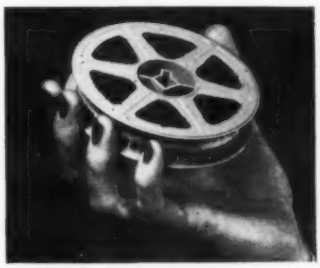
So much for good will—how about savings? Doing away with a description of each toll call on bill has brought an immediate 45% reduction in posting time . . . *that's a $4,000 a year saving!*

Bills now take half the time to prepare!

Saves in other ways—record of checks for daily bank deposit is made by microfilming the checks

The Ashtabula Telephone Company, Ashtabula, Ohio

. . . what was a 90-minute job now takes 15 minutes! Putting other office records on microfilm, like customers' service record cards, also saves much valuable vault and storage space.



Many thousands of customers' service record cards filed on one roll of film!

More than 300 telephone companies use Recordak Photographic Billing. You can, too! —regardless of the size of your company. Prices start at a low $550 for the Recordak Junior Microfilmer; also available on a low-cost rental plan.

"Recordak" is a trademark

Price quoted subject to change without notice

RECORDAK

(Subsidiary of Eastman Kodak Company)

Originator of modern microfilming—
now in its 30th year

MAIL COUPON TODAY

RECORDAK CORPORATION
415 Madison Avenue, New York 17, N. Y.

Gentlemen: Please send me more information on The Recordak Toll Billing System.

CC-8

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Company_____

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- Water-shed
- 3 ways better
- Smooth spinning
- Power for long life

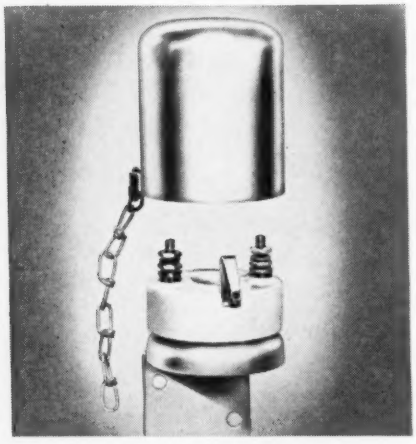
Published regularly to help you get the most out of your materials and supplies dollar

by Philip W. Blood, Office Mgr. and Inside Sales–Pacific Coast

In my 14 years with Stromberg-Carlson I've come to know the careful attention paid to supply orders like yours. When you order equipment from Stromberg-Carlson, **everybody** makes sure it's right. First, the manufacturer. He produces a long-lived product and his good name comes with it. And then Stromberg-Carlson–in delivering the product to you–gives you a guarantee backed by our 62-year reputation. So you get your money's worth for day-to-day operations–and you invest something in the future, because it's your supply business that plays a major part in helping us continue our research for new and better telephone equipment. It's business we certainly appreciate–thanks a million for your continued support!

Convenient drop wire connector

You install Cook Electric Company's "Testerm" Drop Wire Connector where a subscriber's drop is terminated.



For pole or crossarm installation.

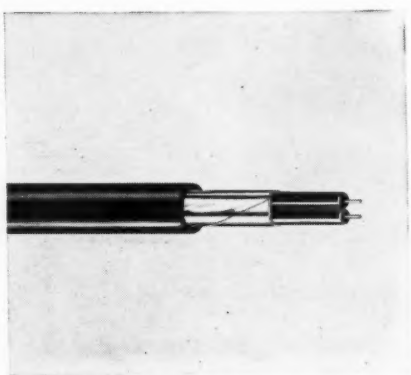
This connector provides terminating facilities for connections to the line wire, and–on the same studs–terminate facilities for connecting the drop wire. Thus when your lineman is testing, he can easily disconnect the drop from the line and quickly reconnect it.

The porcelain base and metal cover are detachable from the mounting bracket by a bayonet locking arrangement of 3 Everdur studs. Wire entrances are sealed by a neoprene gasket.

For convenience and economy, specify Cook "Testerm."

B. U. G. Cable–Outstanding Resistance

For outstanding resistance to moisture, acids, oils and chemicals, specify Ansonia Wire & Cable Company's B. U. G. wire, designed specifically for direct earth burial.

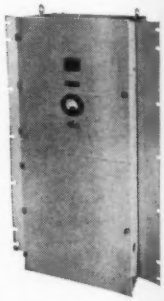


Specifically designed for direct earth burial

This wire features two 16 gauge conductors insulated in parallel with polyethylene, shielded with .004" aluminum tape and covered with a tough, waterproof plasticized polyvinyl chloride jacket.

Raytheon Rectricharger® Battery Chargers—Complete Line 3-400 Amperes

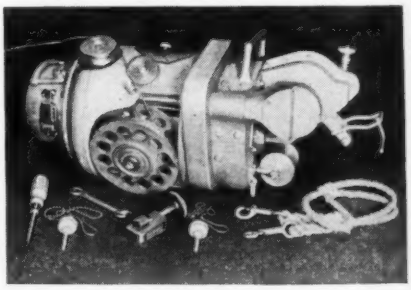
Entirely redesigned new Raytheon Rectichargers offer three major improvements:



New Raytheon battery chargers feature ± 1% no-load to full-load regulation

1. ±1% no-load to full-load stabilization prevents battery overcharging, minimizes gassing, lengthens battery life.
2. No audible hum at output terminals.
3. Most compact units on the market–wall or rack mounted.

Automatically compensated for rectifier aging, Rectichargers offer high efficiency, completely automatic regulation. No moving parts and self-protecting circuitry assure minimum maintenance, long life. Single and three phase, 3-400 amps.



Neale Model "D" pull-type spinner comes complete with metal reinforced plywood chest, lashing wire clamp, two adjustment wrenches, screwdriver, open end wrench, and tow rope.

No slack, no slip when spinning cable

The Neale Model "D" may be used for the placement and spinning of new cable–or for maintenance spinning of existing cable. It is specially designed to operate on ball bearing races, and has a double drive mechanism that eliminates slippage. The Model "D" offers instant adjustment for all sizes of cable–from minimum size to a maximum diameter of 2¼". A ratchet on the strand wheel makes it impossible for the spinning wire to slack off when pull on the tow line is released. Size of machine: length 24", diameter 10".

XUM

Battery life prolonged by strong plates.

The Exide-Tytex Battery is a flat plate type specially designed to give long life. In addition, it offers the advantages of high capacity in relatively small size. Hence it is preferred in many telephone applications.

One of the most important features of the Exide Tytex Battery is the construction of the positive plate. The exclusive, patented Silvium grid resists corrosion—prolongs battery life. Specially shaped horizontal grid bars lock the active material firmly to the plate while presenting only a minimum of exposed metal to the electrolyte. This also effectively shields the grid against corrosion and at the same time insures that every plate will have a maximum of active material in contact with the electrolyte—for higher capacity. Every fifth horizontal bar is 300% thicker in order to give the plates extra strength.

Molded plastic jars require considerably less space than needed by conventional cells. This makes it possible to put more battery capacity into a given amount of shelf area.

Your Stromberg-Carlson representative can offer prompt delivery on your order.

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STROMBERG-CARLSON

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco

Affects Operation Costs

The offering of extended area service affects the costs of operations. The cost effects are the net result of two principal factors working in opposite directions: On the one hand the elimination of the operating expense involved in handling each individual call on a toll basis and, on the other hand, the additional circuits and switching facilities to handle the increased volume of calling due to the stimulation in traffic which results when customers can call toll-free.

The savings from changing from toll operation to local operation are readily apparent. A toll call requires ticketing and timing by an operator, or by some mechanical means; substantial expense is incurred for operating labor and associated switchboard positions, or for the automatic equipment if the operation is mechanized; in addition accounting costs and collection costs are involved.

Sometimes toll operation requires circuitous routing through a toll center to reach the operator, whereas direct circuits between the offices may be used if the call is local.

In the case of the small exchange adjacent to the large exchange, where there is a high volume of calling, the automatic equipment may be rather expensive relative to the number of customers using it.

Under present conditions of handling very short-haul traffic, the costs involved in handling that traffic as toll eat up most, if not all, of the revenue. Most of these costs are not incurred if extended area flat-rate service is offered.

While there are economies in extended area service there are also certain expense factors which increase with extended area service. As I've already indicated, traffic volumes do increase to perhaps three to four times their former number when the toll charge is eliminated.

The carrying charges on the additional facilities needed to handle this traffic will offset to at least some extent the savings in operators' wages, switchboard positions, accounting, and commercial work.

Rates Must Balance Costs

Whatever the net-cost effect is, it will need to be combined with the net effect on revenues in determining the practicability of the particular extended area service plan under consideration.

I can't believe, however, that there is any situation where it would be entirely impracticable to furnish extended area service between exchanges, although there may be a few bridges to cross in getting there.

If there is a real need for it, and a desire on the part of the public to have it, the telephone company—or companies—and I am sure the commission, too—will want to explore every avenue with reason to satisfy this need and desire.

In the final analysis, the real problem is to find a way to make the plan financially practicable, and this in turn means finding a way of getting to the level of monthly rates needed to balance the toll revenue and costs effects. This is not really a difficult problem, because experience shows that generally customers are willing to pay well for value received in telephone service.

I would like to say a few words about what the results of our Illinois Bell customer attitudes studies show. Periodically, we have an outside firm canvass a random-selected group of customers in various exchanges to find out what our customers think about the telephone company, the service we furnish, and the cost of that service.

From these surveys we learn much about how customers feel toward different aspects of telephone service, including the rates. Specifically, each customer in the survey is asked, "Are there any particular telephone rates or charges you feel are unreasonable?". While our customers aren't too critical of our rates, none the less a good many of them do offer specific rate criticisms.

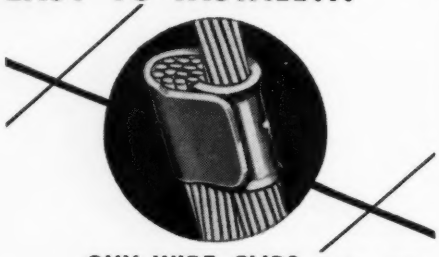
For example, they may direct their criticism at the level of the basic monthly charge, or the charge for a local paystation call, or the three-minute initial period on a long distance call; their comments cover a wide range of rate items. From our analyses of these rate comments, it is apparent that if we have any real sore spot, it is the short-haul toll charge. Approximately one-half of our customers' rate criticisms are directed at the short-haul toll rate. The customer either indicates dissatisfaction with the toll charge he has to pay to one or more nearby points, or he puts it the other way—he wants his local calling area extended.

Customer satisfaction with our rate schedules unquestionably has a strong influence on his over-all attitude toward the company. We place a high value on good customer relations, and we try hard to improve them. I sincerely believe that we buy a lot in good will from the public we serve when we are able to introduce an extended calling plan.

KEARNEY
Time-Savers

LAY-CIT CABLE GRIP for multi-conductor drop wire cables... non-slip double gripping action.

EASY TO INSTALL...

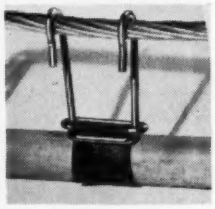


GUY WIRE CLIPS serve up strand ends neatly, quickly... with a single, simple squeeze.

SAVE MAINTENANCE...

HOUSE AND POLE HOOKS ... pull-proven for long-holding service ... hot-dip galvanized.

...FOR YEARS TO COME



CABLE HANGER... neoprene-impregnated glass-fibre strap cannot deteriorate ... holds secure without damaging insulation.

For Better Construction... Safer Maintenance

Specify

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KEARNEY PRODUCTS

JAMES R. KEARNEY CORP., 4224-42 Clayton Ave., St. Louis 10, Mo. • *Canadian Plant:* Guelph, Ontario

Carolina T&T Installs New Microwave System

The Carolina Telephone & Telegraph Co. of Tarboro, N. C., placed a new 125-mile microwave system into service on July 2, 1957.

The first official long distance call over the microwave system between Fayetteville and Rocky Mount, N. C., was originated at Fayetteville by Mayor George B. Herndon and was completed to Mayor P. K. Gravley at Rocky Mount. The message traveled via repeater stations located near Dunn, Princeton and Wilson and terminated at Rocky Mount.

Despite the possible danger of hurricanes in the eastern section of North Carolina, microwave offers many advantages in economy of installation and maintenance, efficiency and versatility.

To avert problems arising from the menace of hurricanes, company engineers ordered five custom-engineered Blaw-Knox self-supporting towers designed to withstand winds of up to 150 miles per hour.

The new microwave system for the company's ever-growing number of subscribers is being installed at a cost of approximately 2 million dollars. This system includes five towers ranging in height from 150 to 250 feet which were erected by Radio Construction Co. of Pittsburgh, Pa.

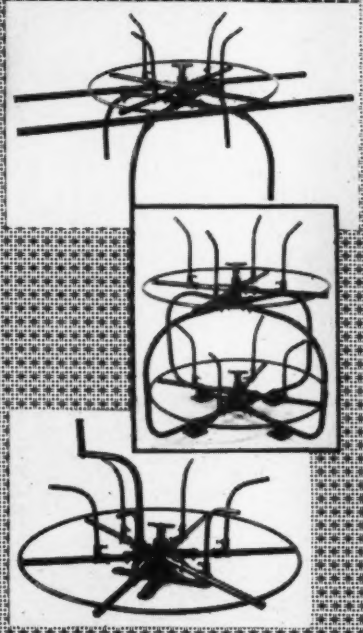
The towers are approximately 23 miles apart, located near Fayetteville, Dunn, Princeton, Wilson and Rocky Mount. Maintenance of the towers will be handled by an independent contractor for the telephone company. Tower installations are normally inspected twice yearly for evidences of corrosion, loose bolts, and replacement of warning lights.

To insure continuous toll service a complex alarm has been designed for the system. It reports various types of trouble or transmission irregularities to Rocky Mount. Even the opening of one of the doors to one of the buildings located near the base of a tower will be reported by the alarm.

Stand-by channels are automatically put into service in the event of equipment malfunction without interruption to telephone or television service.

Some 3,000 telephone circuits can be connected to the new system. If the microwave system is used for television transmission, the message circuit capacity will be greatly reduced. However, the versatility of the system readily enables the company to offer TV transmission facilities. When using conventional wire or cable for TV transmission, the service is unsatisfactory.

The Reel with the Cone Bearing that Never Wobbles



SUTTLE WIRE WHEELS

These sturdy, rigid, steel and malleable iron reels are designed especially for telephone use, both for paying out and taking up wire and light strand.

Eight models handle various size coils up to 400 pounds in weight. Fingers are adjustable for inside diameters from 14 to 29 inches.

CONE BEARING PREVENTS WOBBLE

There is never any spindle "wobble" with Suttle reels because the wheel settles down on the cone as the bearings wear, keeping it snug through the years.

ADJUSTABLE TENSION BRAKE

The friction brake on all Suttle reels is equipped with a big 5-inch wing nut for adjusting brake tension to any degree needed for the wires being handled. Keeps coils under control.

Sold by All Telephone Distributors

See Your SUTTLE Catalog

Serving Independent Telephone Men Since 1910

Suttle EQUIPMENT CO.

LAWRENCEVILLE ILLINOIS

XUM

No newcomer to microwave, Carolina Telephone & Telegraph Co. first installed microwave in 1954. The line which uses two Blaw-Knox self-supporting towers, provides network television to station WNCT, Greenville, N. C.

Engineers supervising the new microwave installation are C. R. Jones, chief engineer, W. D. Edmondson, building and equipment engineer, and R. B. Peters, building engineer.

Obituaries

ARTHUR B. JORDAN, 76, vice president of the Peninsular Telephone Co., Tampa, Fla., died on Aug. 2 from internal injuries suffered in a traffic accident.

Mr. Jordan's career in the telephone field spanned 56 years. He joined Peninsular in 1909, after eight years of service with the MW&O Telephone Co., Wooster, O.

Prior to 1955, he was in charge of Peninsular's postwar building program, in which new buildings were erected and equipment installed in many Florida west coast cities. He was given the title of vice president and named plant consultant for the company in 1955.

Mr. Jordan was a member of the Independent Telephone Pioneer Association and Telephone Pioneers of America.

MATHEW L. OLLIG, 59, owner and operator of the Winsted (Minn.) Telephone Co., died on July 31, of coronary thrombosis.

Survivors include his wife, Antoinette, two sons, James and John, and a brother, L. J. Ollig.

•

REUBEN RUMMELT, 56, of Durham, N. C., equipment engineer for the southeastern district of the General Telephone Co. of the Southeast, died Aug. 6.

A native of Byron, Mich., Mr. Rummelt had been in Durham for 21 years, until recently being connected with the Durham Telephone Co., now a part of General Telephone.

•

MRS. R. E. BROOKBANK, of Pendleton, Ind., wife of the past president of the Indiana Telephone Association, died on Aug. 3 from a skull fracture. Mrs. Brookbank was fatally injured when she fell upon starting out of the house to the assistance of her husband, who had fallen from a ladder outdoors, suffering severe injuries. Mr. Brookbank is in St. John's Hospital, Anderson, Ind.

Claim on Greatness

"The great man is to be the servant of mankind, not they of him."—THEODORE PARKER.

Independent Telephone Week in Ohio will be observed from Sept. 8 to 14, by reason of a proclamation recently issued by Gov. C. William O'Neill. The governor is pictured at left presenting the proclamation to James I. Hunt, president of the Ohio Independent Telephone Association, and president of the Home Telephone Co. of Middlefield. Gustav Hirsch, extreme right, a pioneer in the development of Ohio's Independent telephone business, looks on.

New adapter shank bit

fits either hand brace or power drill

Taper square shank fits hand braces

Cut off taper and use "hex" shank in both power drills and hand braces

Cut your wood bit inventory by 50%

Now you can eliminate the need to stock two types of wood auger bits. Irwin's new Adapter Shank Bit fits both hand braces and power drills.

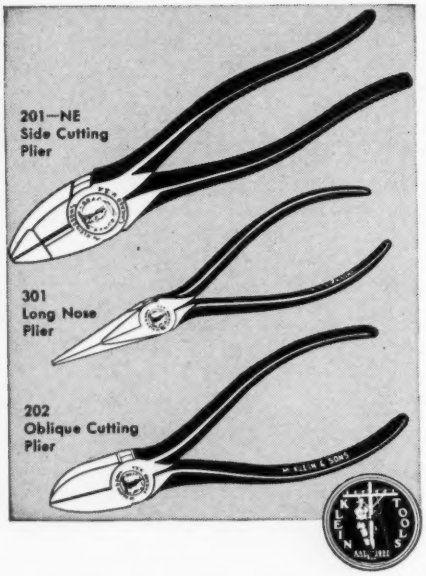
With hand braces, use the Adapter Shank Bit as it comes. Cut off taper square and the Adapter Shank, with its 6 "hex flats", chucks perfectly in power drills or hand braces, either one. No wobble, no run-out. Clean, efficient cutting action. Reduces inventory and record keeping by 50%. Saves time on the job, too. Call your distributor, or write today for complete information. Sizes 4/16" to 17/16", both solid center and single twist types.

***All Irwin Adapter Shank Wood Bits** are forged in one piece from special steel and heat tempered full length for longer life. Plastic coating on balanced cutting heads guarantees factory-fresh sharpness, unequalled performance. Widely used by utilities, electricians and construction workers.*

IRWIN auger bits • screw drivers

Wilmington, Ohio

KLEINS



Standard of the Industry for Over a Century

Ask the lineman on the pole . . . the electrician at the switchboard. They will tell you that the pliers they rely on are Kleins—every time.

Kleins have been serving the electrical industry since the first wires were strung and today have the same high quality, the same fine craftsmanship, the same individual inspection and testing that have won them their place for a century as first in pliers.

A wide variety of sizes and styles to meet any need . . . but only one quality—the highest.

ASK YOUR SUPPLIER

Foreign Distributor:
International Standard Electric Corp.
New York

SEND FOR NEW POCKET TOOL GUIDE

100 years of service to linemen, electricians and industry is back of this new Pocket Tool Guide No. 100. A copy will be sent to you upon request, without obligation.

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Established 1857 Chicago, Ill., U.S.A.
7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS

General of Michigan Names Read to Personnel Post

James L. Read, formerly general traffic supervisor for General Telephone Co. of Michigan, has been assigned to a new position, according to T. A. Saunders, company president.

J. L. READ

Effective Aug. 1, Mr. Read will be general personnel supervisor, reporting to the director of personnel, H. M. Borys.

In his new capacity, Mr. Read will supervise the administration of personnel policy in the company's 155 exchanges. He will continue to be located in the general offices in Muskegon.

Dialaphone Inventor Signs Manufacturing Contract

James Kilburg, the inventor of an alphabetical index that automatically dials up to 890 pre-picked telephone numbers, signed a contract in San Mateo, Cal. on July 28 for manufacturing the device, it has been reported.

The pact was signed with Automatic Electric Co. and also with Western Electric Co.

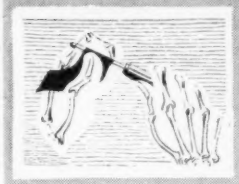
Mr. Kilburg's instrument, known as the Dialaphone, is an accessory that will be available from local telephone companies on a subscription basis only, it was stated.

Mr. Kilburg said that about 150 of the units are in test use at present, and an additional lot of 150 are being turned out. Full-scale production will go into effect in early 1958, the report stated.

Mo. Company Asks to Borrow

The Missouri Public Service Commission on Aug. 5 received the application of Miller Telephone Co. for authority to borrow $13,000 from Stromberg-Carlson.

BE MODERN



Don't rub your fingers to the bone

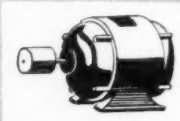
POLISH A PLUG IN 30 SECONDS

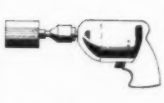
Push-Pull . . . it's that simple, it's that quick with a "Long" plug polisher

Only $9.05 f.o.b. Topeka

The "Long" plug polisher does an excellent job of polishing in just seconds.

Fits electric motor with ½" shaft or can be used with either ¼" or ½" electric drill.





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CABLE SPINNING EQUIPMENT CO.

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TOPEKA, KANSAS

News on New Products

TRANSISTORIZED RECEIVER-AMPLIFIER—A single-stage transistorized telephone receiver amplifier, for increasing the level of incoming speech signals, has been announced by Stromberg-Carlson, a division of General Dynamics Corp.

Particularly helpful to those with impaired hearing, the new RA-1000 receiver-amplifier has been designed for installation with any standard telephone, and may be either desk or wall mounted.

The compact device, only 4 inches long, 2¾ inches wide and 1¼ inches high, is enclosed in a molded plastic case and has a four-conductor cable approximately 3 feet long. This cable, coupled to the points where the receiver is normally connected, is all that is needed to bring the unit into operation. The device is energized when the handset is removed from the hookswitch.

The RA-1000 is equipped with a variable volume control which gives the user a means of adjusting the listening level to his own needs. The amplifier circuit is a grounded emitter type for greater power gain.

The range over which the RA-1000 output level can be varied provides sufficient high-quality reception for most individual demands. When the volume indicator is adjusted to its lowest setting, the RA-1000 output level is at the point required for standard telephone hearing levels. Tests performed on a telephone set with the RA-1000 receiver-amplifier attached showed a gain of 16 db under various line conditions and signal levels.

Because the RA-1000 is a transistorized receiver-amplifier, it rarely requires maintenance, according to the company. Its modest power demands are easily met by the central office battery, thereby averting the need for an equipment-located battery or commercial power source.

Voltage developed across the transmitter is used as a dc supply for the amplifier. The dc current required to operate the amplifier ranges from 0.3 to 2 milliamperes, depending on the loop length and volume control setting. This is a negligible proportion of the current passed by the transmitter, which ranges from 30 to 100 milliamperes. DC power input to the amplifier is from 0.4 to 5 milliwatts.

In terms of economy of installation, alteration of central office equipment is unnecessary. Aside from the low initial cost of the compact device, the only other expense incurred is that of con-

TELEPHONY PUBLISHING CORP.
608 S. Dearborn St.
Chicago 5, Ill.

Please have the manufacturer send me without obligation the literature indicated by the following numbers:

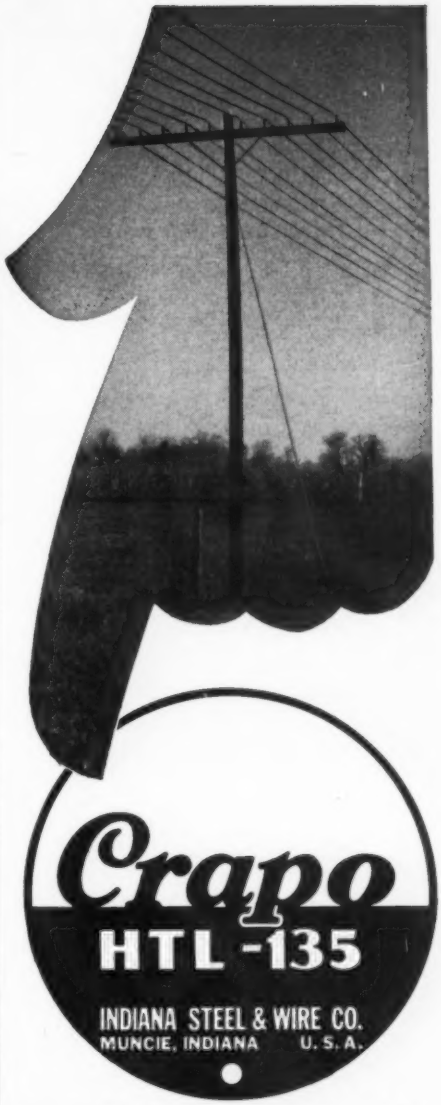
NP717_____; NP718_____; NP719_____; NP720_____;
NP721_____; NP722_____; NP723_____; NP724_____;
NP725_____; NP726_____; NP727_____; NP728_____;
NP729_____.

Name.....Title.....

Company.....

Street.....

Town and State.....
8/17/57



LOWER
Cost Per Mile

● Efficient rural telephone circuits can be built at minimum overall cost where *Crapo* HTL-135 High-Tensile Line Wire is used to full advantage. For *Crapo* HTL-135 makes possible spans up to 350 feet in heavy, 540 feet in medium and 650 feet in light loading districts. Longer spans mean fewer pole structures with substantial savings in material and labor costs per mile.

The rugged tensile strength of *Crapo* HTL-135 and its heavy galvanized coating provide dependable and economical service life on typical rural lines.

Ask your jobber for details or write direct for engineering data!

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STEEL & WIRE COMPANY
Muncie, Indiana

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Multiple Arm

RELAYS *by* SIGNAL

- Versatile — Rugged
- Cast Aluminum Base
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- Contact Combinations on Same Base
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A superior relay that has endured the test of time . . . Specified for many years by America's largest manufacturer of electrical controls and communications equipment.

For complete data, write for Bulletin No. 30-4

Engineering representatives in principal cities

Signal Engineering & Mfg. Co., has changed its name to

Wheelock SIGNALS INC

RELAYS W S LONG BRANCH, N. J.

Just the right capacity for line work...

develops 1500 watts; weighs only 125 pounds; 4-cycle engine power

This workman is drilling holes in a cross arm with power from an Onan 105AK. Unit can also be removed from truck and easily carried to where it's needed.

Prices reduced on many popular models!

Onan Model 105AK-1P Electric Plant

This power-packed lightweight plant supplies all the power you need for electric drills, saws and other equipment . . . and for floodlighting on night jobs, too!

Quick-starting, 4-cycle Onan air-cooled engine is direct-connected to Onan all-climate generator in a single, permanently-aligned compact unit.

Four plug-in receptacles, pilot light and carrying frame are standard. Other lightweight portable and mobile Onan plants from 500 to 10,000 watts.

To save time and speed work on construction and maintenance projects, equip your crews with Onan Portable Electric Plants.

Call your Onan distributor or write . . .

Onan ELECTRIC PLANTS

D. W. ONAN & SONS INC.

4063 University Ave. S.E., Minneapolis 14, Minnesota

necting the RA-1000 receiver-amplifier to the subscribers' telephone. In most cases complete installation can be easily accomplished in a matter of minutes. No soldering is required.

The device, embracing the advantages of printed circuitry, is the result of months of advanced research by Stromberg-Carlson, a pioneer in circuit miniaturization, to find a more economical means of providing improved telephone service when incoming speech signals are weak.

Additional information about the RA-1000 receiver-amplifier can be obtained by requesting NP717.

•

EARTH-BORER SPOTTER BASE — A Spotter-Base to position earth-boring units faster and easier during digging operations is announced by the Highway Trailer Co., for its line of skid-mounted earth-boring machines.

The new Spotter-Base "spots" the hole, thereby eliminating the necessity of constant maneuvering of the truck into position for the digging or pole-setting operation. With the spotter the operator can "reach" over digging obstructions such as large rocks and can shift digging direction should an underground obstacle be encountered.

Finger-tip controlled hydraulic positioning allows the operator to position the boring machine within an arc of 80 inches and extend the unit 22 inches from the platform. The boring machine will dig at any point within this arc and within the forward and aft traverse. A hydraulic positioning ram controls auger travel across the rear of the truck body. The Spotter-Base can be mounted on a single axle or tandem truck.

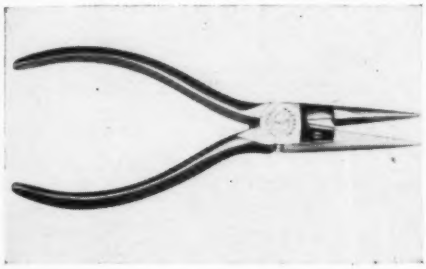
Highway skid-mounted earth-boring machines are designed to dig holes 9 to 36 inches in diameter and up to 10 feet in any soil. Power is furnished by an integrally mounted engine and transmission. Hydraulic controls to in-

crease efficiency and ease of operation are available as optional equipment.

New features on Highway boring machines include an adjustable clutch with side ports in the clutch base affording easy access to clutch and brake collars for quick adjustment, and a capstan winch which takes its power directly from the transmission, utilizing all speeds of the transmission. Request NP718.

•

SHEAR CUTTING PLIER—Mathias Klein & Sons has developed and applied for a patent on a new long nose, shear cutting plier. What the company describes as a unique principle permits clean cutting of hard or "dead" soft wire.



The shearing blade is quickly removable and may be replaced if necessary in a matter of seconds. The plier is ideal for tough assembly jobs, the company reports. It is furnished standard with self-opening coil spring and 1/16-inch diameter point. Its Klein catalog No. is 208-6C. Request NP719.

•

HYDRAULIC POWER PUMP—A new, portable high-pressure hydraulic power pump, which fills the need for two-speed, fast-approach operation, has been introduced by Greenlee Tool Co.

The new No. 798-AC-SA power pump, driven by a ¾ hp, 115-230 volt, electric motor, will handle a wide variety of hydraulic power applications, including Greenlee benders for pipe and conduit. Under instant finger-tip control at all times, tests show that this pump can operate a hydraulic ram or jack three to five times faster than a hand pump.

This pump, featuring a fast-approach, two-speed action, will, as the ram load increases, automatically change over to high-pressure. Simple, easy operation is the most appreciated feature of this new pump according to contractors who have job-checked it with benders and other hydraulic tools.

Three position control—advance, neutral, and return—is provided, with neutral holding the ram pressure and position while the motor is running. Valving provides high-pressure advance only and allows spring action, manual, or gravity return of the ram.

Capable of working at a continuous pressure of 6,000 psi, the pump can develop up to 10,000 psi intermittent pressure.

This pump is also available powered by an ac-dc universal electric motor or a 4-cycle gasoline engine. All models

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Working Alone
Can Identify
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Cable Pairs
3 Times Faster
Than 2 Men
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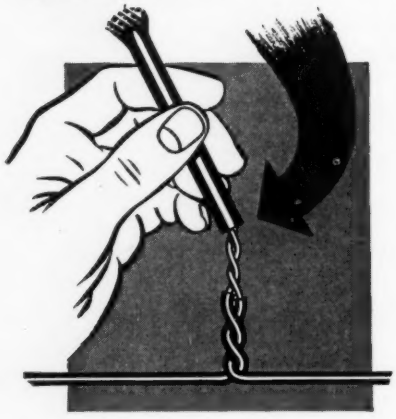
"Super-Splice"®
makes splices
waterproof
...from
inside out!

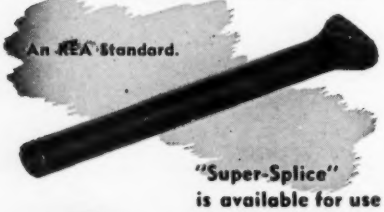


Superior Cable's exclusive economical "Super-Splice" is a plastic splice sleeve. It is sealed at one end and comes to you filled with an insulating and waterproofing compound.*

"Super-Splice" prevents leakage currents and breakdowns in the presence of moisture . . . good for 25,000 v. d. c.

Can be easily removed to re-enter the splice . . . the compound never hardens or oozes out no matter what the temperature.

*A Dow-Corning silicone compound.



"Super-Splice" is available for use with straight, butt or bridge splices.

For further information on economical "SUPER-SPLICE", write

SUPERIOR CABLE
SUPERIOR CABLE CORPORATION
Hickory, North Carolina

are also offered with a four-way valve for two-direction action, providing both hydraulic advance and return of the ram. Request NP720.

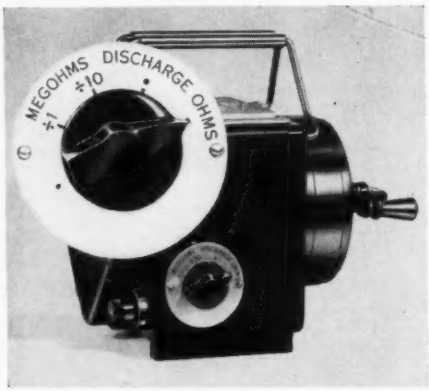
•

MEGGER TESTER SWITCH—A new four-position switch has been introduced on the Meg type of Megger insulation tester by James G. Biddle Co. The hand-operated generator models now provide facilities not formerly available in one instrument.

The A-R-K switch includes:

A. Megohms $\div \times 1$ and $\div \times 10$
R. Ohm scale
K. Capacitance discharge switch

In addition there are earth, line and guard terminals so arranged as to require no change of connections when switching to the ohm scale.



(1) The Ratio Switch (A switch) divides by 10 the regular megohm scale. Thus an instrument having a normal range of 0 to 1,000 megohms also has, with the ratio switch, a range of 0 to 100 megohms, permitting insulation resistance measurements down as low as 10,000 ohms.

(2) The Discharge Switch (K switch) permits the discharge of capacitance in the apparatus under test. This charge is built up during the test because the test voltage is dc.

(3) The Ohm Scale (R switch) has a range from 0 to 10,000 ohms. With it tests can be made of conductor resistance without resorting to other test equipment—often of great advantage when trouble shooting in the field. The ohm scale is used in addition to and independently of the megohm scale.

This facility for discharging capacitance removes the hazard to persons and equipment that might come in contact with charged apparatus following the test.

The charge is dissipated in a manner that does no harm to the apparatus or the Megger instrument. The discharge switch opens the circuit between the measuring portion of the instrument and the testing terminals, and short-

An 8-tier run of Soapstone OCT-O-DUCT provides a new telephone link down hard-rock Nob Hill to colorful Chinatown in San Francisco.

YOU CAN ACTUALLY SEE SOAPSTONE DUCT SAVE YOU MONEY

1 Trenchside delivery of Soapstone OCT-O-DUCT eliminates field inventory problems and makes certain your duct is at your job when you need it.

2 OCT-O-DUCT's convenient 4-foot lengths can be quickly installed by 2-men crews even in narrow and deep trenches.

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The many time- and work-saving features of Soapstone OCT-O-DUCT and full information on the sizes, bends and accessories available from this 30-year-old Company are contained in our Catalog and Installation Manual. For your FREE copies, drop us a note on your letterhead.

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circuits the latter through a current-limiting resistor. Request NP721.

•

DRY-BLEND VINYL RESIN—A new vinyl resin, used with a new extrusion technique, enables fabricators to produce high quality products at top production rates. Controlled pressure extrusion allows operation at maximum screw speed of which the machine is capable.

The new technique employs a valve for controlling pressure continuously. With it, the new resin, which is designed primarily for dry blending, produces a product that is comparable to and in some cases superior to that achieved with some hot-flux materials now on the market.

Both the new resin, designated QYRS, and the basic concept of pressure-controlled extrusion are the result of extensive development work at Bakelite Co., division of Union Carbide Corp. The dry-blend process has become popular among fabricators because of its simplicity, economy and flexibility, Bakelite states. As a result of this development, it has been recognized that proper control of pressure during extrusion improves mixing characteristics and, ultimately, product quality and production rates.

The new dry-blend resin has a high bulk density of 30 to 35 pounds per cubic foot that permits larger tonnage output rates from a given size blender. It also has a high specific viscosity of 0.205 to 0.220 that results in improved physical properties such as strength. Narrow particle distribution in QYRS ensures maximum extrusion rate, minimum dusting and proper dispersion of plasticizer with resin.

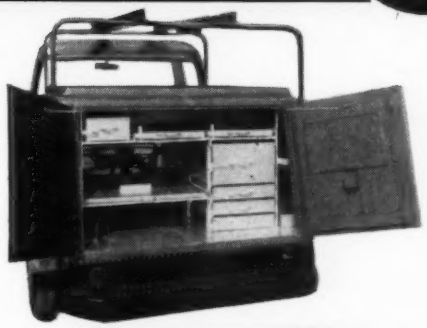
Fabricators can use the same blending cycle with QYRS as they presently employ with other dry-blend resins, or they can use a shorter cycle if desired. Tests have proved that QYRS will dry blend 10 to 15 per cent faster than conventional dry blend resins, while still maintaining excellent dispersion of ingredients.

QYRS is suitable for telephone wire, building wire, flexible cord, appliance wire, power cable and for contour extruded items such as garden hose, welting and belting, the company reports. It is well suited for preblend formulations used in both electrical and non-electrical applications. Request NP722.

•

PHASE VOLTAGE CONVERTER—Kato Engineering Co. has announced a new rotating phase voltage converter. Weighing only 39 pounds, this compact, light-weight converter, changes single

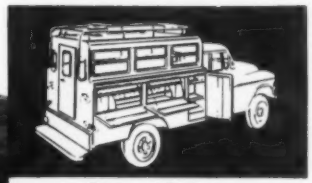
SERVICE BODIES by UTILITY BODY OAKLAND



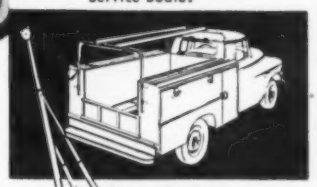
Series I-40
INSTALLERS BODY

Special Truck Body developed for telephone installation and service work. Provides maximum storage space for necessary parts and materials, readily accessible, easily inventoried. An **advance design** incorporating all the **latest features**—easily adapted to varied urban and rural service problems.

OVERALL LENGTH is 81", width 58" (approximately 6 feet across fenders). Length at top, 72¼", length at floor line, 79¼". Body designed for installation on any standard chassis with a 38" to 42" cab-to-rear-axle dimension. Space provided for either 4-foot or 6-foot ladders as specified and for all normal telephone installation and maintenance equipment—apparatus, directories, pay-out reel, wire, belts and materials. Spare tire is carried on special sliding tray in left-hand compartment.



Personnel Carrier Service Bodies



Service Bodies

Line Construction Service Bodies & Hydraulic Derricks

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Please send price and delivery information on Series 1-40 Installers Body. I would also like information on:

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COMPANY_____

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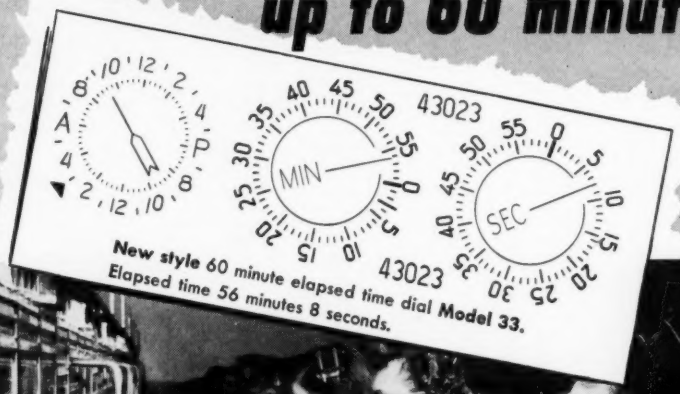
Distributors in all leading cities

CALCULAGRAPH

Now Automatically gives you accurate Toll Call Records— up to 60 minutes



New style 60 minute elapsed time dial Model 33.
Elapsed time 56 minutes 8 seconds.

Photo courtesy of Union Telephone Co., Owosso, Mich.

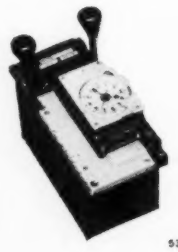
Now, Calculagraph, the modern dependable computer, automatically figures and prints toll calls up to 60 minutes —no need to add 30 minutes on long conversations.

Thus, Calculagraph adds one more feature to reduce human errors by busy operators and increases the volume of calls handled per operator. Assures you of all revenue due on every call.

For accurate toll call records, for automatic computation of elapsed time, for more efficient operation, install the new 60-minute elapsed time Calculagraph on your switchboard.

Information on this new Calculagraph is yours upon request.

Write today for illustrated brochure to Dept. T.



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CALCULAGRAPH Company
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DEPENDABLE ELAPSED TIME COMPUTERS SINCE 1892

phase, 115-volt, 60 cycle ac to three-phase, 230-volt, 60-cycle current. Frequency is held constant within a fraction of a cycle.

The durable aluminum alloy frame houses capacitor starter as well as both output and input receptacles, and is about 10 inches high without carrying handle. Intake and exhaust air vents are located in lower halves of endbells, making the converter drip proof. Heavy duty grease sealed ball bearings produce very little noise.

Equipped with vibration dampeners, the machine can be used to change phase and voltage for sound track equipment if placed a few feet away from recording equipment.

Other models and sizes, now in the engineering stage, developed to meet growing demands for on-the-spot phase and voltage conversion, will soon be available. Request NP723.

•

COMPUTER—A new memory storage unit, called the 738, has been added to the IBM 704 Data Processing System at General Electric's jet engine plant in Cincinnati, O. The result is the most powerful computer available to industry.

The 738 unit, with 1,179,648 tiny doughnut-shaped magnetic cores, can store up to 32,768 "words" of information—four times the former maximum storage on the 704. (A "word" is the equivalent of a six-letter English word.)

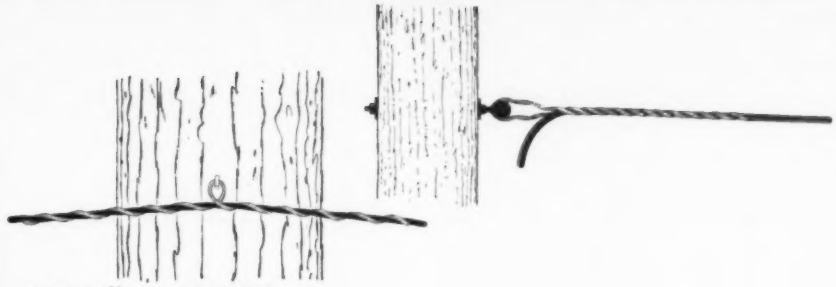
The new high-speed memory also contains 432 IBM-made transistors mounted on printed circuit boards. Transistor circuits act as an amplifier for the memory's sense circuits.

When used in conjunction with the IBM 704, the 738 allows information to be read into it, or out again, in 12 millionths of a second.

The new memory unit, with other electronic computing equipment, was in-

XUM

GUY-GRIPS eliminate clamps and reduce strand required . . . do not slip! Tests prove that even extra high-strength steel strand breaks outside the Guy-Grip when subjected to impact, repeated load or gradual tension. Save 50% installation time.



FOR "C" RURAL

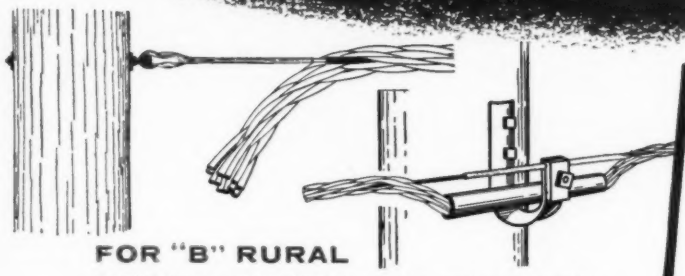
TANGENT SUPPORTS AND DEAD-ENDS

Made of stainless steel for corrosion resistance, these Preformed Tangent Supports and Dead-Ends are coated with Neoprene to cushion their grip and uniformly distribute holding pressure. Designed for 2 - #14 or 2 - #12 "C" Rural conductors, they assure a low radial pressure over the entire holding area and prevent slipping, thus eliminating a major cause of resagging. Note multiple-wire bail of Dead-End.

for the Telephone Industry . . .

PREFORMED PRODUCTS

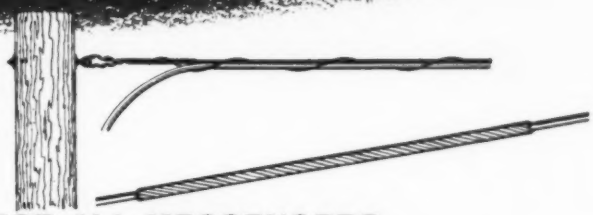
Used and praised by a growing list of leading Telephone Companies, Preformed Products are the result of *progressive* ideas backed by *extensive research* and *sound engineering* insuring the ultimate in *field performance. Ask your Telephone Supplier for complete details of their exclusive advantages.*



FOR "B" RURAL

PREFORMED DEAD-ENDS are the easiest-to-install, non-slip answer to dead-ending. Can be installed without cutting messenger.

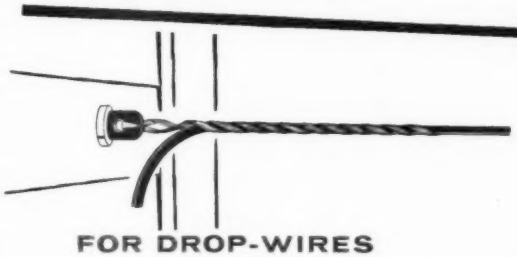
PREFORMED ARMOR RODS protect insulated messengers against clamping pressure or abrasion damage.



FOR ALL MESSENGERS

PREFORMED DEAD-ENDS AND SPLICES are the surest, safest and non-slip means of splicing and dead-ending all sizes of messengers. Easy to install . . . no tools required.

PREFORMED LASHING RODS, individual Preformed Rods designed to lash cables to messengers require no clamps. Neat. Easy to install. No tools needed. Can be removed and reused.



FOR DROP-WIRES

DROP-WIRE DEAD-ENDS of stainless steel . . . Neoprene coated . . . cushion the grip; eliminate abrading or cutting through insulation; provide low radial pressure over the entire holding area . . . no damaging concentrated pressures. No slippage or cold flow. Multiple-wire bail prevents fatigue failure.

FOR SELF-SUPPORTING CABLE

PREFORMED DEAD-ENDS AND LINE GUARDS with their large-area, uniform, low-pressure contact surfaces are the only devices in their classification that can be used safely with plastic-covered multiple cable. They were specially designed upon request for this use.

Made in accordance with or for use under one or more of the following U.S. Patents: 2,275,019; 2,587,521; 2,609,653; 2,691,865; other patents pending.

PLP

PREFORMED LINE PRODUCTS COMPANY

[illegible] St. Clair Avenue • Cleveland 3, Ohio

1. BASHLIN Quality Tool Buckets . . . (Built to Last Longer) The original Fibre Top Buckets

2. Good, Tough Buckskin Work Gloves

3. BASHLIN Quality Boots and Footwear

4. BASHLIN Quality One Piece Steel and Adjustable Aluminum Climbers with Replaceable Gaffs

5. BASHLIN Body Belts with additional Nylon Safety Feature

6. BASHLIN Leather and Nylon Safety Straps

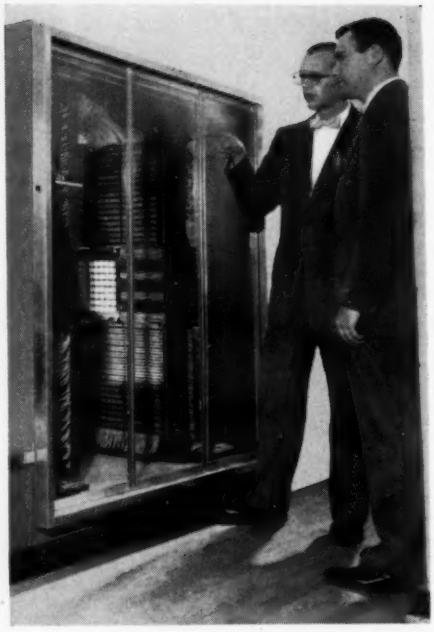
Distributors in Strategic Areas in U.S.A.

EXPORT: Copperweld Steel International Co.
IN CANADA: A. B. Chance Co. of Canada Ltd. Toronto

Ask for . . .

CATALOG NO. 156

W. M. BASHLIN CO.
GROVE CITY, PA.



stalled in a five-day, round-the-clock operation. It is now at work helping the 704 solve business and scientific problems.

One of the complex jobs the computer can now perform at even greater speeds with the 738 is "flying" an aircraft, complete with engines, that is still in the idea stage.

The system, developed by G-E technicians, consists of a special method of transferring airframe and engine performance information onto computer cards and a method of setting up the machine so that it can digest the information on these cards.

All the cards are combined and fed into the computer and desired information on the performance of the proposed airplane is obtained automatically in a very short time—often as short as 20 seconds. Request NP724.

•

PRIVATE LINE CARRIER EQUIPMENT—The Budelman Radio Corp. has announced current production of their Type PLC private line telephone carrier equipment which is a practical carrier to provide private line service on a multi-party telephone line without running additional physical lines and without impairing or interfering with existing services. Up to four channels on one existing physical line can be added without mutual interference.

Among the most important advantages of the new Budelman equipment are simplicity and adaptability, states the company. Further, because the equipment is completely recoverable it is ideal for meeting emergencies or for temporary or seasonal private line service.

By following the simple instructions contained with the unit, any qualified telephone maintenance man can make the installation in a few hours without special training. Simply "connect" and "operate."

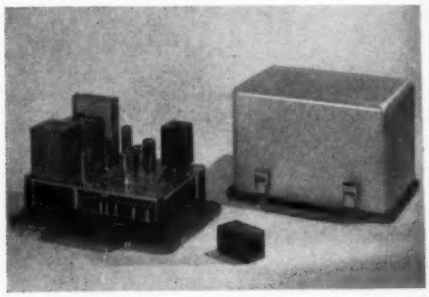
Listed by Underwriters' Laboratories, Inc., the units are easy to install. At the central office the standard 3½-inch x 19-inch panels are "stacked" in any convenient rack or cabinet, and at the subscriber end the unit is enclosed in an attractive metal cabinet which is readily mounted to the wall of the garage, basement or other suitable place. After connecting to the subscriber's house current and installing simple voice pass filters, the equipment is ready to operate.

Detailed information is available by requesting NP725.

•

TELEMETERING AND CONTROL TERMINALS—Moore Associates has announced new dual-channel telemetering and control terminals.

Designed for telephone lines or cables with up to 20 db attenuation between associated transmitter and receiver, these



self-contained units have a wide range of application for remote industrial control and recording. When keyed by switches for control applications or pulse-width signaling transducers for metering, the Model 55 Transmitter (right in photo), provides two independent signaling tones in the frequency range 2.8 to 100 kc. The frequency is precisely controlled by interchangeable plug-in networks for each channel.

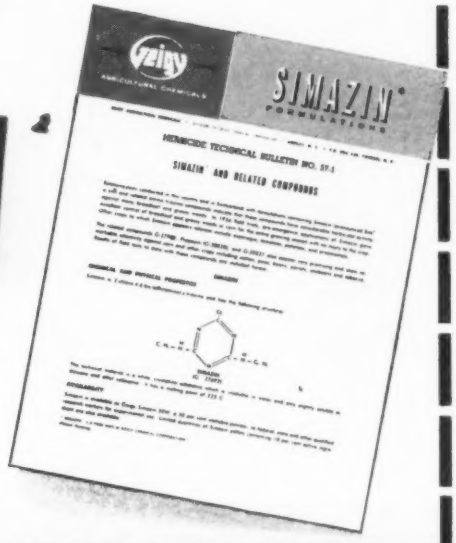
The receiver (left in photo) provides two independent regulated outputs up to 20 and 50 ma for recording transmitted data or, by means of plug-in hermetically sealed DPDT relays, up to 20 amp at 250 v for on-off apparatus control over each channel. The plug-in relays can control up to 1-hp motors without the need for auxiliary contactors.

A unique feature is the narrow bandwidth required for each channel—0.2 per cent, and the close spacing between channels that can be used. The extremely stable plug-in networks permit channel spacing closer than 1.5 per cent in frequency.

This makes available more than 200

To: Geigy Agricultural Chemicals
SAW MILL RIVER ROAD, ARDSLEY, NEW YORK

Please send free descriptive pamphlet and technical bulletin



GEIGY

SIMAZIN* 50W

NEW PRE-EMERGENCE HERBICIDE

One application provides economical year-long control of a wide variety of grassy and broadleaf weeds. For use in driveways, roadways, railroads, walks, paths, industrial sites, around buildings and other non-cropped areas.

check ✓ these SIMAZIN 50W safety features

- ✓ **SAFETY TO HUMANS AND ANIMALS.** Relatively low toxicity.
- ✓ **SAFETY TO ADJACENT VEGETATION.** Almost no lateral leaching.
- ✓ **SAFETY NEAR ELECTRICITY.** Low conductivity. Non-flammable.
- ✓ **SAFETY FOR GENERAL APPLICATION.** No contamination problem.
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- ✓ **SAFETY NEAR FOLIAGE.** Minimizes drift hazard.
- ✓ **SAFETY FOR RAILROAD USE.** Does not leave oily film on tracks. Low electrical conductivity.
- ✓ **SAFETY ON VALUABLE LAND.** Not a permanent soil sterilent.

Get your free SIMAZIN literature today. Read about this effective triazine compound's long residual action. One application of SIMAZIN 50W prior to weed emergence usually provides a full year of weed control. Think how this feature will cut your herbicide and application costs. And remember SIMAZIN's many safety features make it one of the most valued and talked-about herbicides now available. Send for your free Technical Bulletin and descriptive pamphlet on Geigy SIMAZIN 50W herbicide now.

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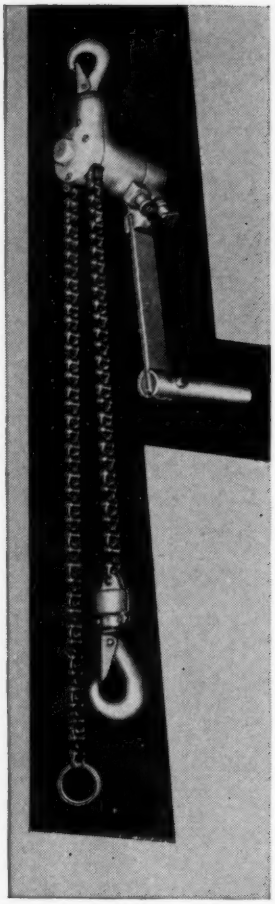


The 9½ pound Coffing Mighty Midget Puller Lifts 1000 POUNDS

Lightweight and compact Coffing Mighty Midget Pullers are handy lifting tools for all kinds of operations in plants and in the field. The 1000-lb. capacity models weigh but 9½ lbs., and will lift the full load with only 40 pounds of handle pull. The 500-lb. model weighs 6½ lbs., and 28 pounds of handle pull lifts the capacity load.

On both models the handle can be used as a crank for fast lifting, or as a lever for working in cramped quarters. Should the puller be overloaded, the "safety valve" handle will give before any load-bearing part fails.

For full information on these sturdy pullers, consult your distributor or write to us for Bulletin MP. **Coffing Hoist Division, Duff-Norton Company, 808 Walter Street, Danville, Illinois.**

TAKE A BIG STEP TOWARD SAFETY WITH DUO-SAFETY LADDERS

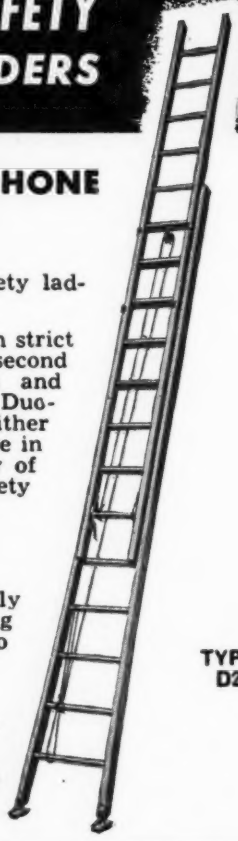
... CUSTOM DESIGNED FOR TELEPHONE MAINTENANCE WORK!

Here's one fine example of the many Duo-Safety ladders ideal for telephone maintenance work.

Type D — a truly great extension ladder built in strict accordance with safety regulations. Rungs are second growth hickory, reinforced with steel rods and equipped with special automatic locks and Duo-Safety's famous Safety Shoes. Made with either straight or parallel side rails, Type D is available in one, two or three sections — in a large variety of sizes. Write for free catalog on all Duo-Safety ladders.

IMMEDIATE DELIVERIES!

Duo-Safety ladders will be shipped immediately upon receipt of order! A planned stock-piling program assures really fast action — there's no delay the Duo-Safety way!



TYPE D2

For Information, Contact Your Supply House, or

DUO-SAFETY LADDER CORP.
809 Ninth Street • Oshkosh, Wisconsin

separate control channels over one telephone line using frequencies between 3 and 100 kc without interfering with the use of the line for normal voice communication.

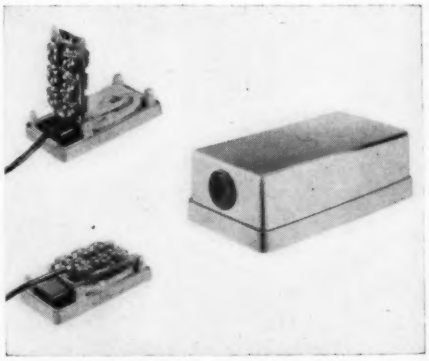
These units are designed for continuous unattended service in remote locations where reliability is paramount. Housed in water and dust-tight cases, the units use conservatively rated MIL-type components and five-star reliable tubes throughout.

The units are mounted by their heavy cast-aluminum bases, and easy access for inspection and service is provided by heavy stainless-steel spring catches which hold the drawn cover firmly against a rubber gasket.

These units are intended for use in remote control and telemetering by water companies, pipelines, power companies, industrial plants, railroads, mines, and radio data links. Request NP726.

•

SERVICE FITTING—A new service fitting for telephone wiring, designed for use with underfloor wiring systems, is being marketed by National Electric Products Corp.



The No. 7906-LC service fitting—using standard telephone harness wiring—accommodates up to six No. 44-A Western Electric terminal blocks and a No. 7-E buzzer. It is equipped with a standard 1-inch bushed opening.

Designed primarily to serve installations of key telephone systems, the large capacity service fitting eliminates marring of desks resulting from mounting of equipment.

Less than 3 inches high, the new telephone service fitting is especially engineered for installation in floor areas where height is restricted by desks or free-standing equipment. Coupled with the functional advantages of underfloor wiring systems, the die-cast aluminum fitting complements modern desk trim and office equipment.

Ample wiring capacity is provided by a 1¼-inch nipple from underfloor duct to service fitting. Additional flexibility is achieved by slotted base mounting

(Please turn to page 58)

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FILE
the "I gotta go look" type
the "Let's call a conference" type
All kinds of folks need
the "My arm is asleep" type
the "I need both hands" type

d loud-speaking telephones!

Automatic's Loud-Speaking Telephone can be put at a centralized point in a conference group and still not cause feedback, because the microphone is in the base of the telephone. The Type 88 doesn't waste working space either—it's the same size as a regular telephone, and the control unit is separate, for mounting under the desk.

It's surprising how *really* convenient telephoning can be with Automatic's Type 88 Loud-Speaking Telephone. And it's wonderful, too, how many people will say: *"I want one"!* With it, a man can talk and keep both hands free; he can move about and do other work while talking. His voice is picked up from several feet away, by a microphone in the base of the telephone—and he hears the other party over a speaker.

The Type 88 works simply. To answer, you merely press a button; when finished, you need only press another. It has proven invaluable as a conference telephone because many persons can enter into the same conversation.

Subscribers are naturally happier, more productive, with Automatic's Loud-Speaking Telephone. And telephone companies are gaining substantial added revenue. If you'd like to learn more about this profit-making telephone, write for Circular 1857. Address: *Automatic Electric Sales Corporation, Northlake, Illinois. Or call FIllmore* 5-7111.

AUTOMATIC ELECTRIC

A member of the General Telephone System—One of America's great communications systems

GENERAL SYSTEM

Dependable

It's good to know the insulators you choose will stand up under all weather conditions, carry heavy loads easily, and resist breakage throughout their long, long life. There's no question about it when you use Armstrong Glass Insulators. They're made of tough industrial glass, and samples from each run are tested three ways . . . to make sure the threads are absolutely accurate, for mechanical strength, and in a rugged thermal shock test. **For complete details** about Armstrong Insulators, get in touch with Armstrong Cork Co., Glass and Closure Div., 295 Fifth Ave., New York 16, N. Y.

Armstrong
GLASS INSULATORS
for communications . . . for power

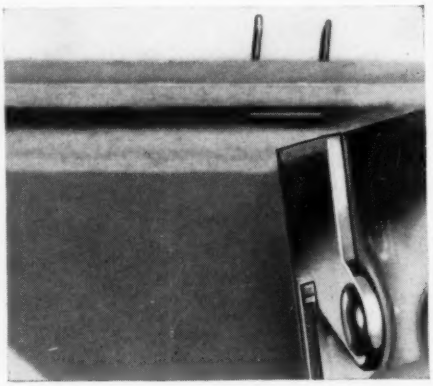
which permits the unit to be moved sidewards approximately 3 inches on the adapter nipple.

The new No. 7906-LC is designed for use with both standard underfloor duct systems and electrified cellular steel floor systems. Request NP727.

•

STAPLE FOR CEILING TILE—The first major change in 10 years has occurred in staple merchandising with a staple called Ceiltile, designed specifically for fastening ceiling tile, the Arrow Fastener Co. announces.

It is stated that Ceiltile drives absolutely flush, eliminating buckled tiles. Ceiltile's newly designed leg and special cement coating give considerably more holding power, says the company. More-



over, they penetrate cleanly. Arrow engineers report you can drive a Ceiltile staple through the flange of a ceiling tile, holding it in your hand, without fracture or damage, whereas certain other staples may tear the tile's flange.

The new staple fits Arrow T-50 gun tacker, which takes six different size staples and can also be used for insulation, upholstering, and hundreds of other fastening jobs. Request NP728.

•

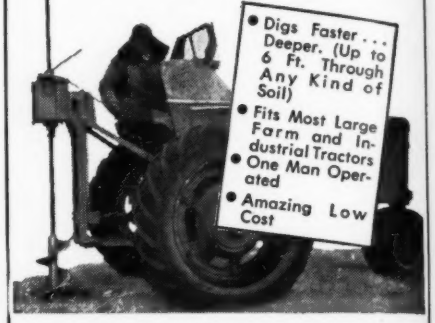
HEATLESS DRYER—The availability of what is described as a completely automatic dynamic dehumidifier, which provides a continuous flow of superdried air or gas with no need for any reactivation heat whatsoever, has been announced by Trinity Equipment Corp., manufacturers of Industrol dynamic dehumidifiers.

Available under the trade name of Industrol Heatless Dryer (patent applied for) the new unit will be offered in 18 models with chamber sizes from 2 inches to 30 inches in diameter, capable of delivering air or gas at effluent dewpoints of —100° F. and below at line pressure.

Announcing that the new unit will be on display for the first time at the Instrument and Automation Show being held at the Cleveland Auditorium from

NOW! A HEAVY-DUTY
INDUSTRIAL DIGGER
that is TRACTOR MOUNTED

Designed for RUGGED DIGGING
• Telephone Poles • Footings
• Heavy Posts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• One Man Operated
• Amazing Low Cost

Prewitt's NEW INDUSTRIAL DIGGER allows one man to do the job it would ordinarily take a crew of men to do. P.T.O. driven, it utilizes full weight of rear of tractor to force auger into ground. Saves time and money!

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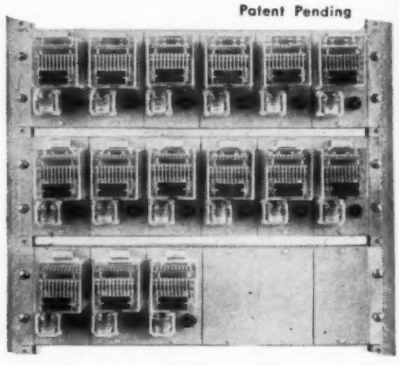
J.R. PREWITT AND SONS
SINCE 1929
Pleasant Hill, Missouri
Phone 40

NEW
CODE-TO-SELECTIVE RINGING CONVERTER

Patent Pending



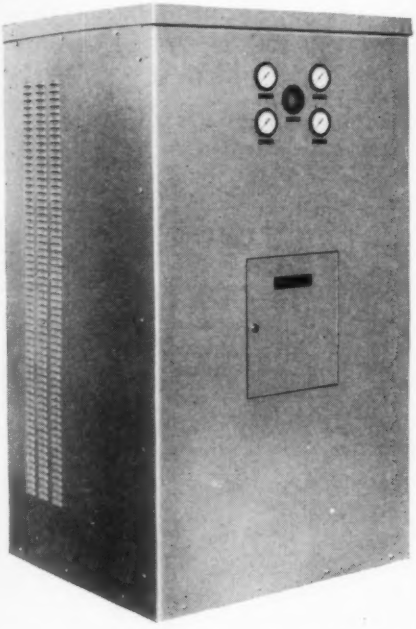
Furnishes full, ten-party selective ringing on multi-party lines. Use with present switchboard and line equipment. Existing equipment does not require modification . . . fits any standard rack. Factory wired for quick installation. Flexible for future growth.

ASK FOR BULLETIN NO. 554

Universal Controls also manufactures Digit Absorbers and Computer Intercepts.

UNIVERSAL CONTROLS CORPORATION
P. O. BOX 13122 • DALLAS 20, TEXAS

Sept. 9 thru 13, Trinity spokesmen explained that the new dehumidifier takes advantage of the long-lasting natural properties of a standard dessicant to come to equilibrium with its surroundings, thus completely eliminating both



the need for steam or electric heaters and their resultant KW and steam consumption.

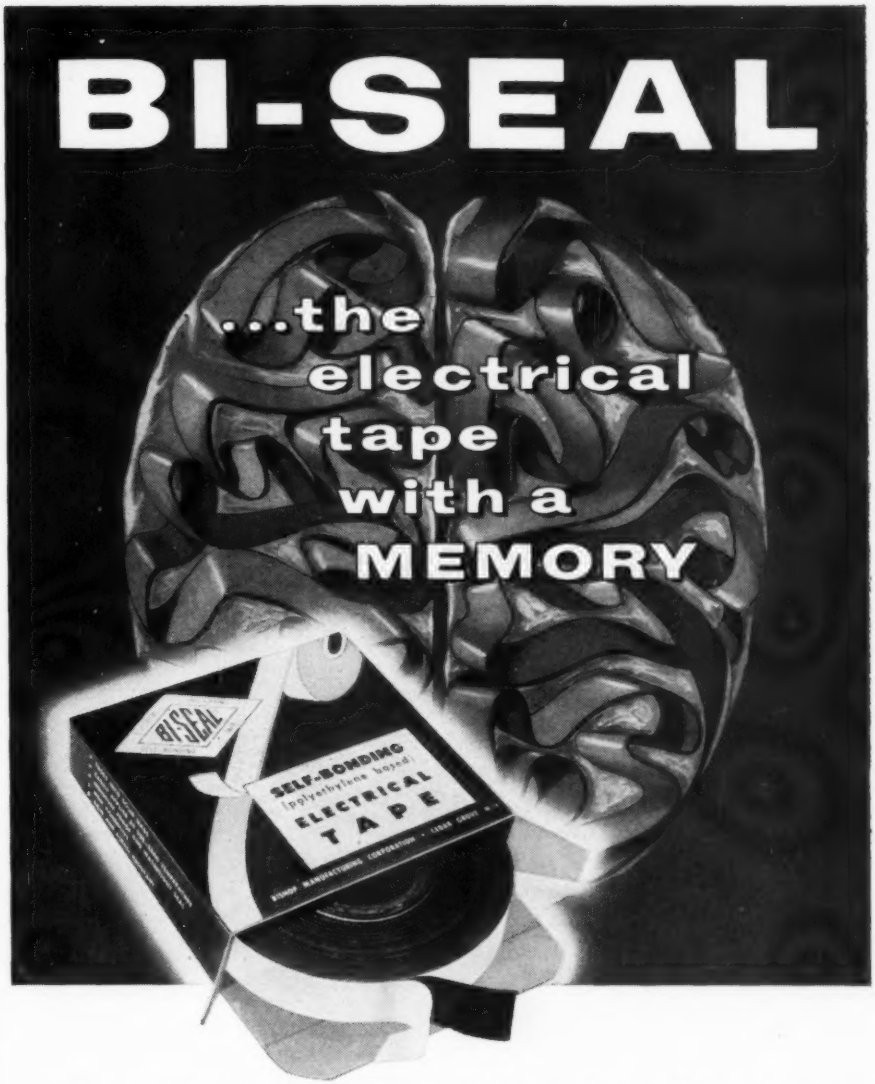
In addition, the company listed a number of other outstanding advantages inherent in the design of the new unit, including a virtual elimination of corrosion problems (as they usually occur as an end product of reactivation), elimination of explosion-proofing costs (by the utilization of a pneumatically operated control), reduction in both installation and maintenance costs, and a simplification of outdoor installation since the need for insulation is eliminated. The unit will provide effluent dewpoints of —100° F to —140° F. continuously, regardless of even major fluctuations in the temperature of the gas or air, according to the company. Request NP729.

IBM Makes Midwestern Sales Appointment

International Business Machines Corp. has appointed L. J. Pastor special representative in the communications department of the company's midwestern sales region.

He will coordinate sales activities and planning of applications of IBM equipment to meet the needs of the telephone, telegraph, and broadcasting industries, and conduct classes for IBM sales representatives and customer personnel to keep them abreast of data processing developments in their particular field.

Mr. Pastor, who attended Cleveland



Bishop's Bi-Seal, a self-bonding (polyethylene based) electrical tape, possesses the unique characteristic peculiar to many plastic products . . . a retentive memory. When Bi-Seal is stretched during a normal splicing operation it "remembers" its original shape and fuses into a tight, homogeneous mass in an attempt to return to its normal form.

Within seconds a Bi-Seal splice has become a long-lasting, water tight seal, virtually non-absorbent and offering high dielectric strength and unusual resistance to moisture, corrosive atmospheres and chemicals.

Bi-Seal performs efficiently on any insulation and is unexcelled for cold weather applications, as low as —55°C. . . . never brittle, never shatters, conforms perfectly to the most complex shape or contour . . . lasts as long, or longer than the original insulation.

Highly recommended for communication and power distribution wire and cable splicing, moisture-proofing bi-metal connections, sealing corrosion-resistant conduit couplings, and insulating high frequency electronic circuits. Accepted by REA for insulating plastic telephone cable.

Write today for your free copy of Bishop's new tape catalog.

Bishop Bi-Seal is available from your distributor.

INDEPENDENT

ELECTRICAL INSULATING BI-SEAL SELF BONDING TAPE

BISHOP

MANUFACTURING CORPORATION

12 Canfield Rd., Cedar Grove, New Jersey

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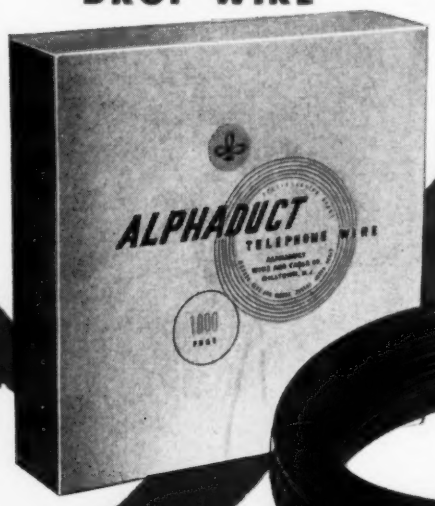
DROP WIRE



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String your drops with Alphaduct. They'll last longer, serve better and lower your costs on maintenance, repair and replacement.

The tough DuPont neoprene jacket resists abrasion, aging, moisture, sunlight. The Alphaduct insulation sticks to the conductor like glue.

Step-testing during every phase of manufacture insures uniform high quality, and the handy carton packaging protects the wire until you're ready to use it.

So sure are we . . . that you'll not find a longer lasting drop wire . . . that every coil is dated . . . so you can see for yourself that it lasts like we say it does.

Alphaduct neoprene jacketed drop wire is available in parallel, twisted pair and dumbbell type construction. Try it.

IT'S DATED • FOR YOUR CONVENIENCE AND PROTECTION

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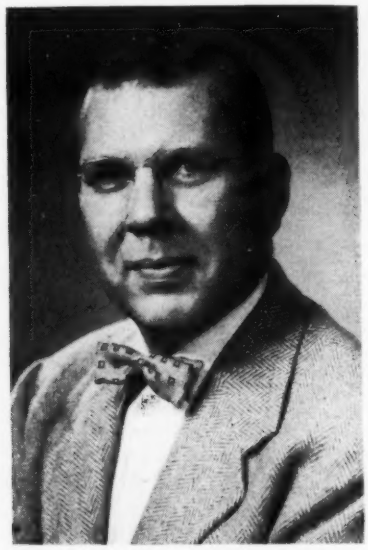
NATIONAL DISTRIBUTORS—AUTOMATIC ELECTRIC SALES CORP., NORTHLAKE, ILL.
LEICH SALES CORPORATION, CHICAGO, ILL.
REGIONAL DISTRIBUTORS—THE LINDSAY TELEPHONE SUPPLY CO., CLEVELAND, OHIO
PANKEY SUPPLY COMPANY, CHARLOTTESVILLE, VA.

College, joined the company in 1947 as a member of the service bureau staff. Prior to his present appointment he was a sales representative in the company's Cleveland, O., sales office.

Morris to Head Stromberg's Telecommunication Research

Appointment of Frank A. Morris as director of the newly-established Stromberg-Carlson telecommunication research department has been announced by John H. Voss, vice president and general manager of the telecommunication division. Stromberg-Carlson is a division of General Dynamics Corp.



F. A. MORRIS

In his new position, Mr. Morris will be directly concerned with the coordination of research with practical application and development of products in the field of telecommunications.

As project engineer, Mr. Morris was a pioneer in the development of one of the world's first complete electronic switching systems at Stromberg-Carlson. Since 1945 he has directed research in wire communication, including toll ticketing, which is the automatic recording and computation of toll call billing information. This involved data processing, and the development of code recognizing devices designed for the telephone industry, but suitable for many other applications as well.

Mr. Morris, who has been with Stromberg-Carlson since 1943, holds 16 patents in the field of telephony. These include portions of the XY dial step-by-step system, PBX trunk hunting, party identification, and multi-digit code detecting systems.

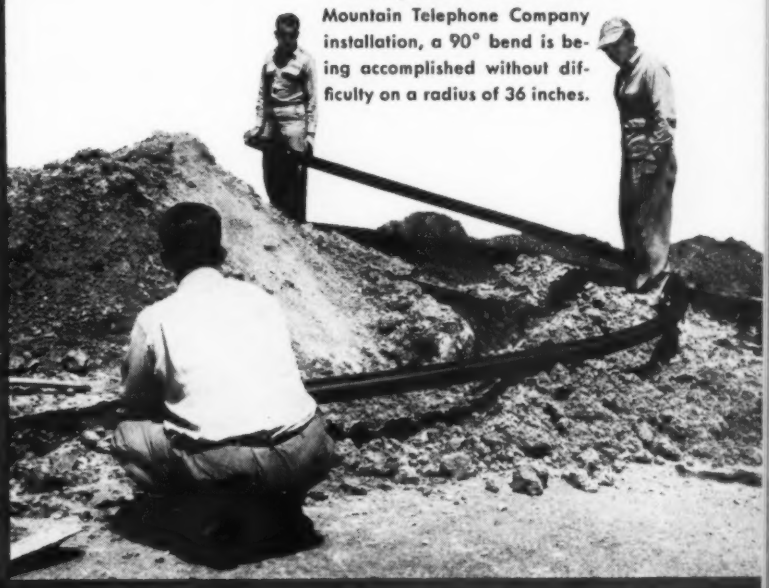
A graduate of the University of New Hampshire, he received a B.S. degree in electrical engineering in 1937. Later

Butyrate conduit is light in weight

One man easily lifts six 20-foot lengths of 2-inch conduit of Tenite Butyrate to be used by Kingsport Utilities in installing a "white way" in a city block at Kingsport, Tennessee. Installation time is reduced, because this conduit is so easy to handle. Transportation costs are reduced, as more conduit can be handled at one time without the usual weight problems.

Butyrate conduit changes direction without fittings

Its semi-rigidity permits it to curve without the use of costly and job-prolonging fittings. With direction changes made so much easier, engineers find that planning and revising are also simplified. In this Inter-Mountain Telephone Company installation, a 90° bend is being accomplished without difficulty on a radius of 36 inches.



Butyrate conduit needs no "babying"

Its high impact strength enables conduit of Tenite Butyrate to be covered with concrete or subjected to any normal backfilling operations. Heavy backfill materials may be tamped in over it with the usual tamping bars.

Could conduit of Tenite Butyrate assist you in your operations?

Conduit of Tenite Butyrate plastic is finding ever-growing acceptance among progressive utilities for use in carrying electric power or telephone cables.

Why?

Utilities are discovering that Butyrate is an ideal material for cable conduit. It is tough, durable, corrosion resistant and non-inductive. It can withstand all normal abuse before, during, and after installation. What's more, conduit of Tenite Butyrate is available in 20-foot lengths to reduce the number of joints in the line. The lightweight lengths can be cut with ease and joined in seconds with slip-sleeve couplings and solvent cement.

For substantial savings in both installation and maintenance, investigate conduit of Tenite Butyrate plastic. For further information and a list of suppliers, return the coupon below.

1932–EASTMAN'S 25TH YEAR IN PLASTICS–1957

TENITE
BUTYRATE
an Eastman plastic

EASTMAN CHEMICAL PRODUCTS, INC.
subsidiary of Eastman Kodak Company, Kingsport, Tennessee

Please send me information on cable conduit made of Tenite Butyrate and a list of companies manufacturing Butyrate conduit and fittings.

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COMPANY_____

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he joined Bell Telephone Laboratories, where he worked on Toll Crossbar, and on the first coaxial transmission of television from Philadelphia to New York in 1940. He also was associated with the International Telephone & Telegraph Corp. before joining Stromberg-Carlson.

Mr. Morris is a member of the American Association for the Advancement of Science, the Acoustical Society of America, the Association of American Railroads, the American Institute of Electrical Engineers, and the Society of Motion Picture and Television Engineers.

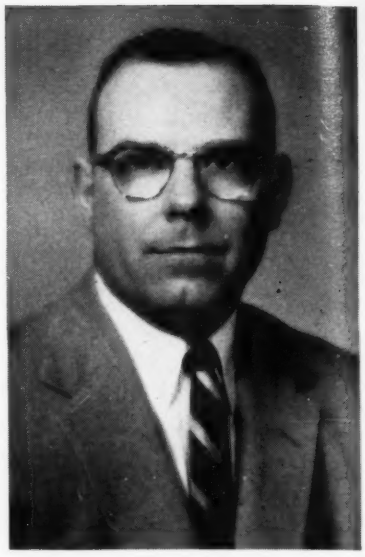
Reliable Electric Names Ritter Sales Engineer

Reliable Electric Co. announces the appointment to its sales staff of Victor G. Ritter as sales engineer. Mr. Ritter was raised in Columbus, O., and holds a B.S. degree from Otterbein in Westerfield, O. He also has attended Columbia University and the University of Virgina.

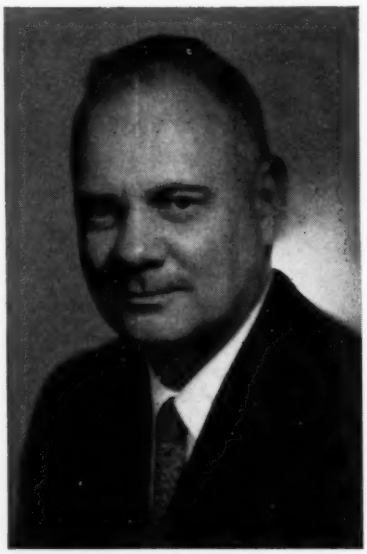
In 1941, Mr. Ritter entered the Signal Corps. During the period he spent in Service, he served with the Alaskan Communication System and the Department of Communications in Korea. He was discharged from the Army with the rank of captain.

Mr. Ritter had been associated with the Ohio Power Co. and the American Gas & Electric Service Co. prior to entering Service, and with the Ohio Consolidated Telephone Co. after returning to civilian life. In 1953 he was made general plant engineer of the Ohio Consolidated Telephone Co., the position he held prior to joining Reliable Electric Co.

Mr. Ritter will be located at Portsmouth, O., and will cover the territory of Kentucky, Tennessee and the southern part of Ohio and Indiana.



V. G. RITTER



William L. McGuire has been elected vice president and general commercial manager, and named to the board of directors of Automatic Electric Co. Mr. McGuire was formerly the company's general counsel.

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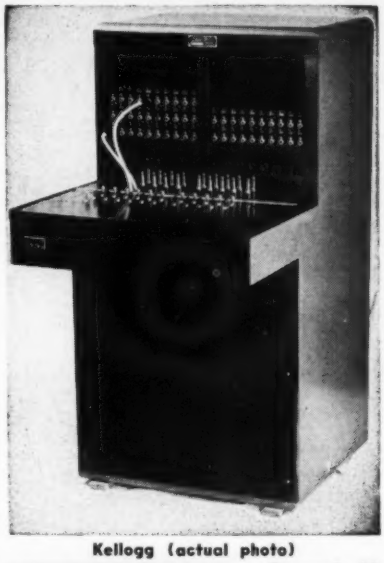

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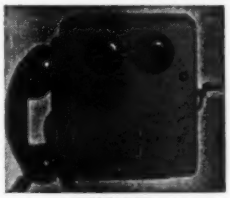

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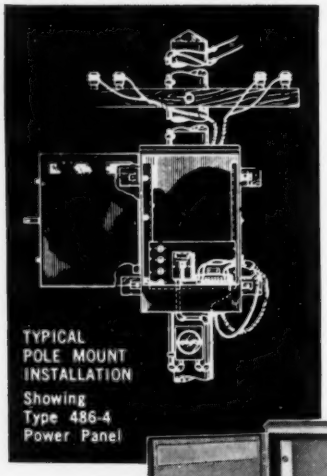

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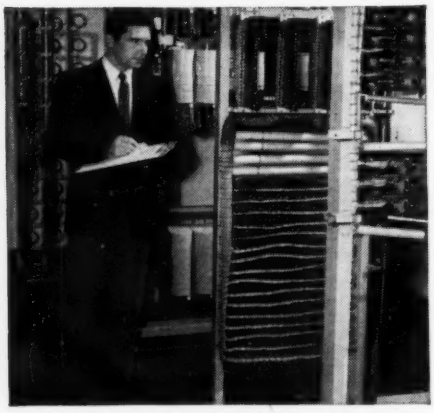

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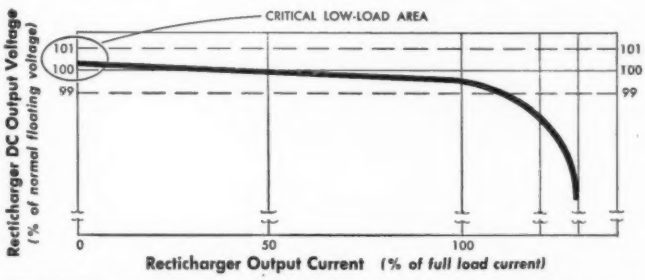

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